LANCASHIRE

COUNTY COUNCIL.

Prevention and Treatment of Tuberculosis in the Administrative County of Lancaster

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Report
on the Tuberculosis Services of the
Lancashire County Council
for the year 1945.

PRESTON:
PRINTED BY T. SNAPE & CO. LTD., BOLTON'S COURT,
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COUNTY TUBERCULOSIS COMMITTEE.

(1947)

The Chairman of the County Council :
County Alderman Sir James Aitken, J.P.

The Vice-Chairman of the County Council :
County Alderman H. Hyde, J.P.

Chairman of Committee :
County Alderman P. F. Mannix, M.D., M.CH., B.A.O., J.P.

Vice-Chairman :
County Councillor G. E. Hardman, J.P.

County Aldermen :

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H. F. Jeffery, Esq., M.B., Ch.B., J.P.
W. T. Miller, Esq., J.P.
Lady Openshaw, J.P.

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Sanatorium and Hospital Sub-Committee.

Dr. P. F. Mannix and G. E. Hardman, Esq. (Chairman and Vice-Chairman of the County Tuberculosis Committee); H. Bright, Esq.; C. W. Doodson, Esq.; Miss E. R. Garnett; J. R. Hull, Esq.; E. Smethurst, Esq.; and J. W. Thorley, Esq.

Selection Sub-Committee.

(*For Senior Appointments*).

Dr. P. F. Mannix and G. E. Hardman, Esq. (Chairman and Vice-Chairman of the County Tuberculosis Committee); Dr. A. Clein; Herbert Norcross, Esq.; Lady Openshaw; and J. W. Thorley, Esq.

STAFF OF THE TUBERCULOSIS DEPARTMENT,

JANUARY, 1947.

(*For further details see folding Table "A"*).

County Medical Officer of Health — F. Hall, C.B.E., M.D., D.P.H., Barrister-at-Law.

Central Consultant Tuberculosis Officer ... ... F. C. S. Bradbury, M.D., D.P.H.

AREA 1 (Population 265,181).

Consultant Tuberculosis Officer ... Dr. H. J. Villiers and one Assistant.

Chief Dispensary ... ... Lancaster.

Hospital ... ... Lancaster Pulmonary Hospital.

AREA 2 (Population : County, 286,464 ; Blackburn, 102,590).

Consultant Tuberculosis Officer ... Dr. G. B. Charnock and two Assistants.

Chief Dispensary ... ... Accrington.

Hospital ... ... Withnell Pulmonary Hospital and Brinscall Annexe.

AREA 3 (Population 361,982).

Consultant Tuberculosis Officer ... Dr. G. Fletcher and two Assistants.

Chief Dispensary ... ... Ashton-under-Lyne.

Hospital ... ... Wolstenholme Pulmonary Hospital.

AREA 4 (Population 353,104).

Consultant Tuberculosis Officer ... Dr. J. L. Armour and two Assistants.

Chief Dispensary ... ... Leigh.

Hospital ... ... Peel Hall Pulmonary Hospital.

Area 5 (Population 329,198).

Consultant Tuberculosis Officer ... Dr. C. Berry and two Assistants.
Chief Dispensary ... ... Waterloo.
Hospital ... ... Rufford Pulmonary Hospital.

Furness Area (Population 39,210).

Consultant Tuberculosis Officer and Medical Superintendent ... Dr. G. Leggat.
Dispensary ... ... Ulverston.
Sanatoria ... ... High Carley Sanatorium, and Oubas House Children's Sanatorium.

Fylde Area (Population 95,405).

Consultant Tuberculosis Officer and Medical Superintendent ... Dr. A. B. Jamieson.
Dispensary ... ... Fleetwood.
Sanatorium ... ... Elswick Sanatorium.

Wigan County Area (Population 101,876).

Consultant Tuberculosis Officer ... Dr. E. H. W. Deane.
Dispensary ... ... Wigan.
Hospital ... ... Wrightington Hospital (Pulmonary Section).

Wrightington Hospital (371 beds).

Medical Superintendent ... ... Dr. J. Dobson.

Chadderton Pulmonary Hospital (52 beds).

Visiting Medical Superintendent ... Dr. E. T. Holden.

Heath Charnock Pulmonary Hospital (51 beds).

Visiting Medical Superintendent ... Dr. J. Rigby.

Mass Miniature Radiography Unit.

Medical Director ... ... Dr. J. N. Parker.

Visiting Consultant Surgical Staff.

Wrightington Hospital.

Orthopaedic Surgeons ...	... Professor H. Platt. Professor T. P. McMurray, C.B.E.
Chest Surgeon	... Mr. F. R. Edwards.
Gynaecological Surgeon ...	... Mr. M. M. Datnow.
Ophthalmic Surgeon	... Mr. J. A. McCann.
Honorary Urological Surgeon	... Professor C. A. Wells.
Urological Surgeon ...	... Mr. J. Cosbie Ross
Ear, Nose and Throat Specialist	... Mr. G. G. Mowat.
Anaesthetist for chest surgery	... Dr. J. Halton.

Thoracic Surgery.

Consultant Adviser in Thoracic Surgery	... Mr. H. Morriston Davies.

High Carley Sanatorium (132 beds).

Chest Surgeons	... Mr. F. R. Edwards. Mr. W. F. Nicholson.
Anaesthetist	... Dr. J. Halton

Elswick Sanatorium (70 beds).

Chest Surgeons	... Mr. F. R. Edwards. Mr. W. F. Nicholson.
Anaesthetist	... Dr. J. Halton.

Visiting Dental Surgeons.

High Carley and Oubas House Sanatoria	... Mr. A. Miller.
Elswick Sanatorium ...	... Dr. R. D. Allison.
Wrightington Hospital ...	... Mr. J. J. Ward.

Senior Administrative Staff.

Messrs. H. F. Hughes, M.A., F.S.S. (administrative assistant); H. Bradshaw (chief clerk), E. F. B. Hindle (chief steward), I. Parker, P. Boardman, J. Totty and J. H. Knott.

LANCASHIRE COUNTY COUNCIL.

COUNTY TUBERCULOSIS COMMITTEE.

To the Chairman and Members
of the Lancashire County Council.

Ladies and Gentlemen,

I have the honour to submit the Report of the Central Consultant Tuberculosis Officer, Dr. F. C. S. Bradbury, on the detailed work of the Tuberculosis Department for the year 1945.

I am,

Your obedient Servant,

F. HALL,
County Medical Officer of Health.

County Offices, Preston,
10th January, 1947.

REPORT OF THE CENTRAL CONSULTANT TUBERCULOSIS OFFICER FOR THE YEAR 1945.

Introduction.

The numbers of deaths from both pulmonary and non-pulmonary tuberculosis are the lowest ever recorded.

The number of new cases of pulmonary tuberculosis coming under notice shows no tendency to fall, and the previous year's high record level is maintained. This fact is associated with continued heavy work at the dispensaries, since the numbers there found to be tuberculous are only a fraction (actually 18·6 per cent.) of the total who attend for examination and diagnosis.

For non-pulmonary tuberculosis the position is reversed, and the number of notifications reached a record low level.

Comment on these statistical matters is made in the first section of the report (pages 12 and 13).

Institutional accommodation has been a serious difficulty, owing to increasing needs and diminishing staffs, but the position has been met by obtaining beds at various non-county institutions, and by using for tuberculosis purposes wards in isolation hospitals, where nowadays beds are not so urgently needed as formerly.

The present (December 31st, 1946) waiting list of 126 represents approximately 10 per cent. of the number of patients in institutions, and compares favourably with 26 per cent. for the country generally.

Mass radiography has been in progress since 1943, and special reference is made in the report to the results so far obtained (pages 18 to 27).

While we are still without any drug treatment for tuberculosis which approaches the popular conception of a " cure," the treatment of lupus—a severe and unpleasant form of tuberculosis affecting the skin—has made definite progress by recent discoveries. A special contribution on this subject appears on pages 27 to 29.

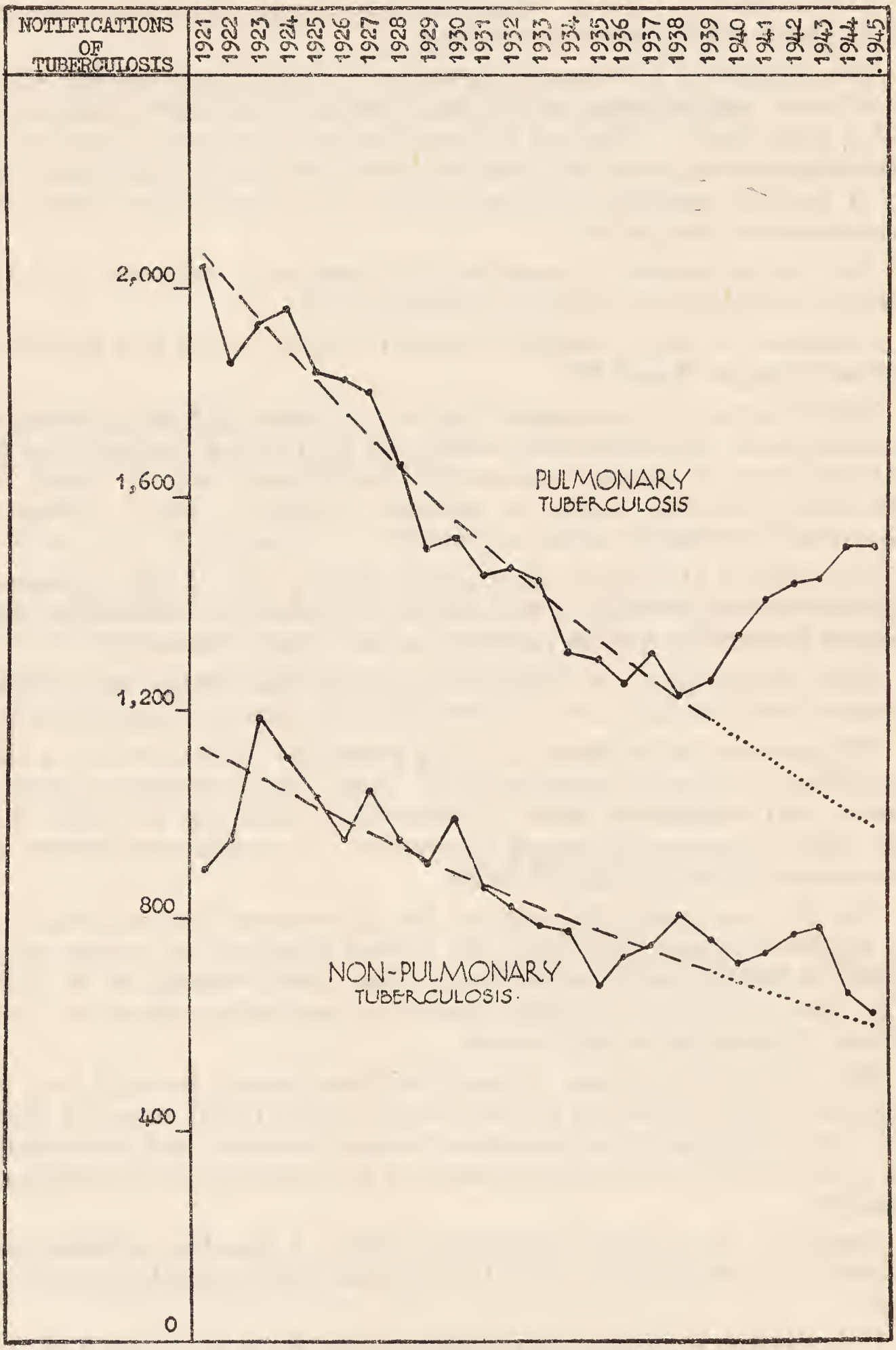
For the most part, the work of the department has continued on well established lines, and while the present standard of results gives ground for satisfaction, the knowledge that much remains to be done before tuberculosis is conquered ensures a continuing search for new methods of investigation and control.

The tuberculosis scheme of the Blackburn County Borough has, by agreement, been carried out by the County Council staff since 1st July, 1944 ; the arrangement has continued to work smoothly and successfully during 1945 aided by the fullest measure of co-operation of the Blackburn authority.

Similarly, the special tuberculosis work of the Isle of Man has continued to be carried out by the County Staff for the Local Government Board.

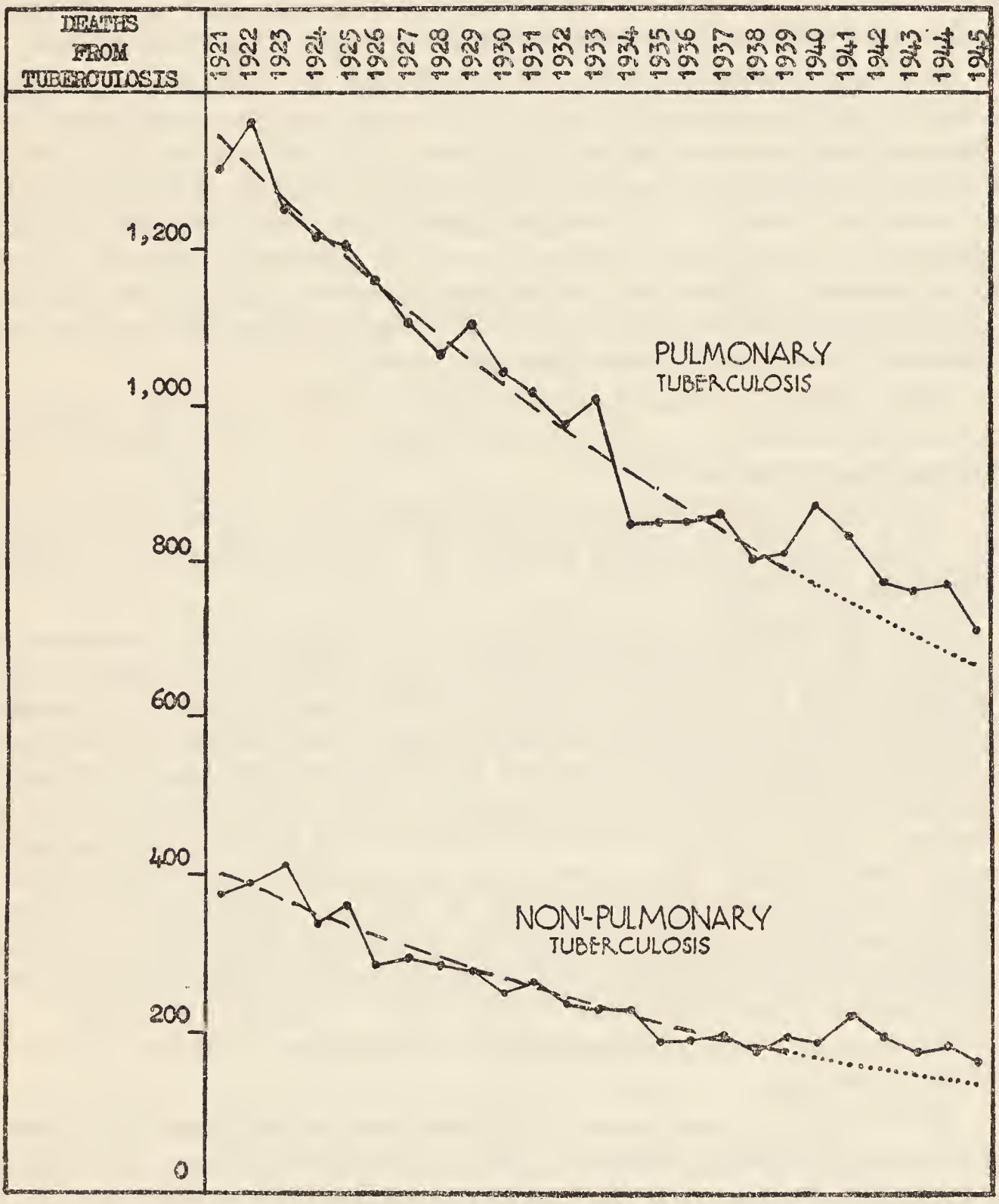
It is desired to record appreciation of the work of the staff of the department, whose loyal support alone makes progress possible.

Chart showing (*a*) the **notifications** of pulmonary and non-pulmonary tuberculosis, 1921–45, and (*b*) the smoothed curve for 1921–39 extended to 1945.



(Chart drawn in Tuberculosis Department).

Chart showing (*a*) the **deaths** from pulmonary and non-pulmonary tuberculosis, 1921–45, and (*b*) the smoothed curve for 1921–39 extended to 1945.



(Chart drawn in Tuberculosis Department).

Tuberculosis Mortality and Incidence in 1945.

Comparison with pre-War Figures.

In the statistics which follow, it is seen that the number of deaths from both pulmonary and non-pulmonary tuberculosis reached record low levels in 1945 in spite of six years of war. This gratifying result, although remarkable, is not so unexpected as might at first appear, if the explanation of the rapid increase in tuberculosis deaths in 1940–41 is borne in mind. It appears that the major cause of these early-war deaths was the failure of existing tuberculous patients to survive the physical and mental hardships of the day. In the ordinary course of peace-time conditions they would have lived longer, but having died in 1940–41, the number of deaths in subsequent years is correspondingly diminished.

It should be also pointed out that although the number of tuberculosis deaths in 1945 is a record, it is not as low as it probably would have been if the war-time increases had not occurred. This is best seen by reference to the charts on pages 10 and 11. In the chart of deaths it will be seen that the smoothed trend of the annual figures from 1921 to 1939 is notably departed from since 1940, and we have still not returned to the pre-war rate of decline. There are indications, however, that we are gradually resuming the pre-war trend, but it will probably take a further few years to overtake the abnormalities of the war years.

The analysis of the possible causes of the war-time increase in tuberculosis deaths is a complex and detailed matter, but the conclusions which emerge are as follow :—

(*a*) As regards pulmonary tuberculosis, the increase was largely due to the inability of existing patients to give themselves the necessary care and protection.

(*b*) As regards non-pulmonary tuberculosis, the increase was largely due to infection of children and others by sputum positive adults, owing to war-time conditions such as billeting, use of communal shelters, black-out and its associated lack of ventilation, and the greater number of patients who remained at home owing to the appropriation of sanatorium beds for other purposes. The object lesson of the war makes it clear that the continued existence of the tuberculous patient and those around him depends on the creation and maintenance of good living conditions, as much as on the organisation of special anti-tuberculosis schemes. In practical terms this means that anti-tuberculosis organisations must include housing, food, and all those indefinable factors included in the term "standard of living." We pride ourselves that our Lancashire scheme aims at taking note of all these measures.

With regard to new cases of tuberculosis, as indicated by statutory notifications, there has likewise been a war-time increase. In trying to interpret this finding it is well to bear in mind that notification figures are not so much a measure of the incidence of tuberculosis as of its ascertainment. That is, they do not strictly answer the quesion "How much tuberculosis is there ?" but rather "How much tuberculosis do we know about ?". Referring again to the printed charts, the war-time departure of notifications of pulmonary tuberculosis from the pre-war

trend is very marked. Perhaps the most interesting feature is that whereas the war-time increase in deaths reached a peak in 1940 and then declined, the increase in notifications still continues. There are probably many factors at work here, such as the results of pre-entry examinations of recruits for the armed forces, the return of service personnel who have developed tuberculosis in the services, the increasing use of mass radiography for the civilian population, and the greater awareness on the part of medical practitioners of the need for suspecting the presence of tuberculosis. All these factors would tend to lead to increased notification.

The war-time increase in non-pulmonary notifications was only of moderate degree, and has almost corrected itself already.

The numbers of new patients taken on the dispensary registers as cases of tuberculosis during the years 1940 to 1945 are appreciably smaller than the yearly numbers of notifications, and something may be learned by comparing the two series of figures.

As regards pulmonary tuberculosis it is found that the marked increase in notifications is accompanied by a considerable increase in new cases taken on the registers, and although it is not clear whether this means increased incidence or improved ascertainment, the practical result is that more cases of pulmonary tuberculosis are now under supervision and treatment.

In the case of non-pulmonary tuberculosis the moderate war-time rise in notifications is not accompanied by any significant increase in the number of new cases taken on the dispensary registers. One may reasonably conclude that the increased notifications relate to patients who died shortly after notification or who did not come under dispensary supervision for such reasons as refusing treatment, leaving the district, or being inmates of mental hospitals. The fact is that as far as dispensary cases are concerned, there is no evidence of an increase in non-pulmonary tuberculosis during the war years, apart from the fatal cases of the disease which have already been considered. It is not surprising, therefore, that the number of notifications of non-pulmonary tuberculosis reached a record low figure in 1945.

This brief statistical introduction is intended to relate our present position to our pre-war position. The figures show us where we stand ; the charts show where we might have been but for the war. From the one we derive satisfaction ; from the other, stimulation to further effort.

Analysis of 1945 Statistics.

In 1945 the population of the Administrative County, as estimated by the Registrar-General, was 1,832,420.

The number (1,511) of new pulmonary cases notified under the Public Health (Tuberculosis) Regulations, 1930, in 1945 is only one less than in 1944, when it was the highest since 1930. There was a gradual increase in the pulmonary incidence from 1939 to 1944 (1,252 notifications in 1939 ; 1,512 in 1944). Non-pulmonary notifications, however, do not show a similar curve, and for 1945 are the lowest on record. Deaths from pulmonary tuberculosis rose in 1940 and 1941, but have declined since then, remaining nearly stationary in 1942, 1943 and 1944, and being the lowest ever recorded in 1945.

The rise in the pulmonary notifications from the onset of the late war compared with the five-year period 1934-38 was 11·8 per cent. (1934–38, average 1,282, 1940–44, average 1,434).

But in 1945 the new pulmonary cases were 59 per cent. of the number notified in 1918 (the fourth year of the 1914–18 war), and the deaths from pulmonary tuberculosis half those reported 26 years ago.

The deaths in 1945 from both pulmonary and non-pulmonary tuberculosis are the lowest on record.

At the end of 1945 there were on the dispensary registers 8,151 patients suffering from tuberculosis (pulmonary 5,223, non-pulmonary 2,928). In addition, 94 patients (87 males, 7 females) who were on the dispensary registers were well enough to be serving in H.M. Forces ; their classification was : T.B. minus 26, T.B. plus 14, non-pulmonary 54.

Applications for treatment under the County scheme were received during the year from 1,934 persons, of which number 136 were cases transferred from other authorities. Of the total applicants, 1,364 were diagnosed as suffering from pulmonary tuberculosis and 556 from non-pulmonary tuberculosis. The gross figure of 2,152 statutory notifications exceeds the applicants because of cases in mental hospitals, removals, etc., which cases do not come on the dispensary registers.

The prevalence of pulmonary tuberculosis among young female adults (aged 15–35) is shown in the new notifications during the past eight years :—1938, 336 new cases ; 1939, 377 ; 1940, 386 ; 1941, 417 ; 1942, 412 ; 1943, 393 ; 1944, 457 ; 1945, 424.

The following table shows since 1913 the new cases of tuberculosis notified each year in the Administrative County together with the case-rate per 1,000 of the population :—

Year.	Notifications.			Case-rate per 1,000 of the population.		
	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)
1913	2,700	1,592	4,292	1·54	0·90	2·45
1914	2,820	1,140	3,960	1·61	0·65	2·26
1915	2,872	1,128	4,000	1·64	0·64	2·28
1916	2,689	1,180	3,869	1·52	0·66	2·19
1917	2,375	1,062	3,437	1·35	0·60	1·96
1918	2,534	885	3,419	1·47	0·51	1·98
1919	2,105	847	2,952	1·21	0·48	1·70
1920	2,084	968	3,052	1·20	0·55	1·76
1921	2,044	899	2,943	1·16	0·51	1·67
1922	1,863	956	2,189	1·05	0·54	1·59
1923	1,937	1,188	3,125	1·09	0·66	1·75

Year.	Notifications.			Case-rate per 1,000 of the population.		
	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)
1924	1,972	1,120	3,092	1·10	0·62	1·73
1925	1,846	1,027	2,873	1·03	0·57	1·60
1926	1,828	953	2,781	1·02	0·53	1·55
1927	1,794	1,045	2,839	0·99	0·58	1·57
1928	1,660	956	2,616	0·91	0·52	1·44
1929	1,517	913	2,430	0·83	0·50	1·34
1930	1,527	982	2,509	0·84	0·54	1·38
1931	1,460	862	2,322	0·80	0·47	1·28
1932	1,477	825	2,302	0·81	0·45	1·27
1933	1,453	780	2,233	0·80	0·43	1·23
1934	1,315	774	2,089	0·72	0·42	1·15
1935	1,305	672	1,977	0·71	0·36	1·08
1936	1,248	722	1,970	0·67	0·39	1·06
1937	1,314	745	2,059	0·70	0·40	1·10
1938	1,227	805	2,032	0·65	0·42	1·08
1939	1,252	757	2,009	0·65	0·39	1·05
1940	1,340	715	2,055	0·70	0·37	1·08
1941	1,414	732	2,146	0·73	0·38	1·11
1942	1,447	766	2,213	0·76	0·40	1·17
1943	1,456	778	2,234	0·78	0·42	1·20
1944	1,512	665	2,177	0·82	0·36	1·18
1945	**1,511**	**641**	**2,152**	**0·82**	**0·34**	**1·17**

Below are given the number of *deaths* from tuberculosis recorded in 1945, together with the death-rates per 1,000 of the population; for comparison the average for the five years 1940–44 is also given :—

	Deaths.	Death-rate.
Pulmonary tuberculosis—		
1945	709 ...	0·38
5-year average (1940–44) ...	805 ...	0·42
Non-pulmonary tuberculosis—		
1945	161 ...	0·08
5-year average (1940–44) ...	192 ...	0·09

All forms—	Deaths.	Death-rate.
1945	870 ...	0·47
5-year average (1940–44) ...	998 ...	0·52

Pulmonary tuberculosis is again more prevalent among males than among females. Allowing for the difference in the population of the sexes, in 1945 for every 100 deaths of females there were 176 deaths of males, and for every 100 female notifications there were 147 male notifications.

The number of deaths from pulmonary tuberculosis in 1945 which escaped notification as tuberculous cases during life (*i.e.*, non-notified fatal cases) was 49 or 6·9 per cent. of the total deaths from pulmonary tuberculosis. Deaths from non-pulmonary tuberculosis during 1945 which escaped notification during life numbered 26 or 16·1 per cent. of the total non-pulmonary deaths.

The following table shows the deaths from pulmonary tuberculosis recorded in the Administrative County during the years 1938–1945 analysed according to sex and age :—

	Deaths from Pulmonary Tuberculosis.							
	All Ages.	Age Groups—Years.						
		0—14.	15—24.	25—34.	35—44.	45—64.	65 and over.
MALES—								
1938	472	2	58	98	99	183	32
1939	479	6	56	89	85	208	35
1940	503	11	57	89	105	197	44
1941	474	4	50	88	115	186	31
1942	442	3	57	86	99	167	30
1943	482	4	57	86	90	202	43
1944	459	5	49	64	90	208	43
1945	436	8	50	61	81	185	51
FEMALES—								
1938	330	10	100	95	53	62	10
1939	335	10	92	112	48	61	12
1940	373	14	119	100	67	52	21
1941	364	11	105	109	59	62	18
1942	334	8	100	87	54	72	13
1943	283	10	85	79	50	50	9
1944	314	7	96	105	48	41	17
1945	273	8	75	88	44	39	19

The table below shows the number of deaths registered and the death-rates recorded during the years 1913 to 1945 in the Administrative County :—

Year.	Deaths.			Death-rate per 1,000 of population.		
	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)
1913	1,441	527	1,968	0·82	0·30	1·12
1914	1,523	572	2,095	0·87	0·32	1·19
1915	1,614	555	2,169	0·96	0·34	1·30
1916	1,685	471	2,156	1·04	0·29	1·33
1917	1,584	466	2,050	1·00	0·30	1·30
1918	1,652	435	2,087	1·07	0·28	1·35
1919	1,339	358	1,697	0·80	0·22	1·02
1920	1,323	396	1,719	0·76	0·23	0·99
1921	1,301	376	1,677	0·73	0·21	0·95
1922	1,362	389	1,751	0·77	0·22	0·99
1923	1,250	412	1,662	0·70	0·23	0·93
1924	1,215	339	1,554	0·68	0·19	0·87
1925	1,205	361	1,566	0·67	0·20	0·87
1926	1,158	286	1,444	0·64	0·16	0·80
1927	1,105	296	1,401	0·61	0·16	0·77
1928	1,066	287	1,353	0·58	0·15	0·74
1929	1,102	279	1,381	0·60	0·15	0·76
1930	1,046	253	1,299	0·57	0·14	0·71
1931	1,021	266	1,287	0·56	0·14	0·71
1932	975	238	1,213	0·54	0·13	0·67
1933	1,010	232	1,242	0·55	0·12	0·68
1934	848	231	1,079	0·46	0·12	0·59
1935	855	189	1,044	0·46	0·10	0·57
1936	856	192	1,048	0·46	0·10	0·56
1937	865	198	1,063	0·46	0·10	0·57
1938	802	177	979	0·42	0·09	0·52
1939	814	195	1,009	0·42	0·10	0·52

Year.	Deaths.			Death-rate per 1,000 of the population.		
	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)	Pulmonary tuberculosis.	Non-pulmonary tuberculosis.	Tuberculosis (all forms)
1940	876	188	1,064	0·46	0·09	0·55
1941	838	221	1,059	0·43	0·11	0·55
1942	776	196	972	0·41	0·10	0·51
1943	765	177	942	0·41	0·09	0·50
1944	773	182	955	0·42	0·09	0·51
1945	**709**	**161**	**870**	**0·38**	**0·08**	**0·47**

Deaths of children from pulmonary and from non-pulmonary tuberculosis during the years 1928 to 1945 are shown below :—

Deaths from Tuberculosis among Children in the Administrative County.

	5-year average.					
	1928-32	1933-37	1938-42	1943	1944	1945
Pulmonary tuberculosis—						
Aged 0—5 years ...	7	3	7	8	8	5
Aged 5—15 years ...	22	15	9	6	4	11
Non-pulmonary tuberculosis—						
Aged 0—5 years ...	75	57	59	56	66	56
Aged 5—15 years ...	43	34	25	27	22	36

Report on the Working of the Lancashire Mass Radiography Unit.

Equipment and Personnel.

The unit began work in October, 1943, and was the first unit outside London to commence operations. A preliminary survey of the work of the unit was presented in Dr. Cox's Annual Report for 1943 (published in March, 1945), from which the following extract is quoted : " In the near future it should be possible to base reliable conclusions on the pioneer work done by our single unit and thereby be in a position to decide how far such work, as is now being done, should be modified or extended to cover a much wider field than is possible at present."

The present report is an attempt to deduce from more extensive data the conclusions foreshadowed in the previous report.

The basis of the unit is a powerful X-ray set specially designed for chest radiography, together with the necessary apparatus to enable large numbers of miniature X-ray pictures to be taken on a continuous roll of 35 mm. photographic film.

In order to deal with the large numbers of persons for whom the apparatus is designed, a specialised team is required, of whom the principal members are the medical director, organising secretary, and qualified radiographer. In addition there are the junior radiographer, dark room technician, marshaller, and four clerks, making a total team of 10.

It has been found possible to deal with about 1,000 to 1,200 persons per working week. This involves the initial X-raying of all those participating, and the subsequent full-size X-ray film and clinical investigation of the small proportion in whom the initial miniature film suggests the presence of some abnormality.

It cannot be stated too often that it is not the function of the miniature film to serve as a basis for diagnosis ; it merely serves to indicate whether the appearances are normal or not, and if not, all subsequent opinions and actions are based on the further investigation of the case.

The work of the unit is not confined to the Administrative County area, for two reasons. Firstly, as it is the only unit available in the Geographical County outside Manchester and Liverpool, some of the smaller county boroughs have expressed a desire to contract with the County for a share of the use of the mass radiography apparatus, and the Ministry of Health have encouraged this co-operation. Warrington and Oldham have already had the services of the unit, *i.e.*, apparatus and team to carry out X-ray surveys in those towns. Secondly, it is unavoidable that the large industrial centres at which it has been found necessary to set up the apparatus will contain both County and Non-County residents among their workpeople, and it is impracticable to discriminate between them when a survey is being arranged.

What happens in practice, therefore, is that in the case of a factory situated in the County area, many Non-County residents will undergo an initial X-ray examination at the County Council's expense. Conversely, when the unit is working in a county borough, many County residents will have an initial X-ray examination at the county borough's expense. In other words, the works address is the criterion of payment.

Results of Surveys.

A delay of many months may occur between the completion of a survey and the compilation of the results of that survey, because of the number of doubtful cases of tuberculosis who are referred to the dispensaries for observation, including the dispensaries of outside authorities. It may take a year or more to decide in some cases that a person is free from active tuberculosis, and that it is safe to allow him to live and work normally.

For this reason the results which follow deal only with the findings up to 16th January, 1946, *i.e.*, the results of the first eight surveys, comprising 74,208 persons. Two further surveys have since been completed, and a third is in progress. The results to be presented may be regarded as reasonably representative, in that they deal with approximately three-quarters of the work done by the mass radiography unit to date.

A brief summary of the results is shown in the following table excluding, for the present, non-tuberculous conditions :—

Findings from Mass Radiography of 74,208 persons.

Active pulmonary tuberculosis		239 cases= 3·2 per 1,000.
Inactive pulmonary tuberculosis—		
(*a*) Referred to dispensary	301	
(*b*) Referred to own doctor	165	500 cases= 6·7 per 1,000.
(*c*) Refused treatment	34	
Healed pulmonary tuberculosis		1,515 cases=20·4 per 1,000.

The descriptions " active," " inactive," and " healed " are those prescribed by the Ministry of Health, but for purposes of interpretation and administrative action some elaboration is necessary, as will appear presently.

It will be noted that healed tuberculosis was found to the extent of 20·4 cases per 1,000 examinees, but this finding is of no practical importance, since healed tuberculosis is neither a personal nor a public health problem.

It is also seen that active tuberculosis was found in 3·2 cases per 1,000 examinees. This is definitely an important finding, but it is not a complete statement of the position, and requires to be considered in conjunction with the " inactive " group.

The group classified as inactive tuberculosis consists of those in whom the disease was in process of healing, or possibly healed already, but the evidence was considered insufficient to justify an immediate opinion. Most of these persons were referred to a dispensary for observation, and by following up a sample of them for 18 months it was found that only one-fifth had been taken on the dispensary registers as definite cases of tuberculosis requiring supervision.

Those who were not referred to a dispensary were referred to their own doctors, or refused treatment. In either case, it is reasonable to suppose that if they also had been followed up for 18 months, not more than one-fifth would have been ultimately regarded as requiring dispensary supervision.

It has, therefore, been assumed that of the inactive cases, one-fifth represent cases of sufficient importance to warrant grouping them with the active cases as cases of significant tuberculosis ; and in the remainder of this report the term " significant tuberculosis " means active cases plus one-fifth of the inactive cases. Apart from this adjustment, the figures on which the report is based are the actual returns supplied by the mass radiography unit.

In the light of the foregoing explanation, the above table may be re-written in a more useful form as follows :—

Findings from Mass Radiography of 74,208 persons (re-grouped).

Cases of significant tuberculosis—		
(*a*) Active	239	
(*b*) Inactive	100	339 cases= 4·6 per 1,000.
Cases of non-significant tuberculosis—		
(*a*) Inactive	400	
(*b*) Healed	1,515	1,915 cases=25·8 per 1,000.

It is noted that the incidence of significant tuberculosis is 4·6 cases per 1,000 examinees. In order to compare this with the incidence of tuberculosis in the general County population, note must be taken of the facts that the mass radiography findings refer to pulmonary tuberculosis only, and that mass radiography as applied to factory personnel, deals with particular age and sex groups of the population.

The known incidence of pulmonary tuberculosis in the Administrative County as a whole is at present 3·0 per 1,000, and the calculated rate for the selected age and sex groups corresponding to factory personnel is 4·3 per 1,000. In fact, only 64 persons were included in the whole 74,208 examined who were already on the dispensary registers, giving a rate of 0·9 per 1,000. It therefore appears that the incidence of unknown tuberculosis among factory personnel is much greater than the incidence of known tuberculosis, although allowance must be made for the fact that most persons who already had tuberculosis would probably think it unnecessary to participate in a mass radiography survey.

Put more generally, it may be said that in addition to the pulmonary tuberculosis in the general population of which we are aware through the ordinary channels of notification and the dispensary organisation, there is an approximately equal incidence in those age and sex groups represented by factory workers, of which we have no knowledge apart from mass radiography.

The 64 persons found to have tuberculosis, who were already on the dispensary registers, have been excluded from the present survey, and the finding of 4·6 cases of pulmonary tuberculosis per 1,000 factory personnel represents previously unknown cases of tuberculosis.

The abnormal condition of the population during the years under review, owing to the recruitment of large numbers of fit persons into the services, makes it difficult to assign a reason for the apparently high incidence of pulmonary tuberculosis in factory personnel. It may be noted, however, that most of the newly-discovered tuberculosis is in the early, symptomless stages, whereas dispensary patients are mostly examined because they have symptoms.

There are indications that two age-groups are specially concerned in the finding of tuberculosis in factories, *viz.*, men over 45 and women under 25. It is not difficult to imagine why, in 1943–5, men over 45 working in factories showed a higher incidence rate of pulmonary tuberculosis than other men of the same age. Presumably in normal times they would more readily have absented themselves from work if not feeling fit, but under war-time conditions they were impelled to keep at work in spite of ill health. Similarly, the excess of pulmonary tuberculosis in young women can be explained by their unaccustomed industrial conditions—heavier work, longer hours, shift work, more travelling, etc.

If these reasons are sound, one may conclude that in normal times mass radiography will probably detect less pulmonary tuberculosis in factory personnel than is already known in similar groups of the general population. It is important to keep this conclusion in mind when applying the results of war-time surveys to forecast peace-time developments.

The Purpose of Mass Radiography.

The results now presented show that in addition to the tuberculosis we know of, there is a hidden reservoir of tuberculosis which we are unlikely to tap except by mass radiography. We want to know how important it is to tap it, and what we are likely to gain by doing so. The question may be asked " What is the real purpose of mass radiography ? " and the answer is at least twofold—public and personal, corresponding to the prevention and treatment of tuberculosis.

In the first place, mass radiography is intended to discover cases of pulmonary tuberculosis before the disease has progressed so far as to cause symptoms, on the assumption that this earlier detection will lead to an improved chance of recovery. There are no figures in the present survey to provide evidence for or against this view, but it is consistent with the finding published in Dr. Cox's Annual Report for 1936, that an improvement of four months in the bringing of patients under treatment after the onset of symptoms was correlated with an increased expection of life of nine months.

The second function of mass radiography is to benefit the public rather than the individual, by detecting and removing unsuspected sources of infection. In this case also it is impossible to provide statistical evidence by which the importance of this function of mass radiography can be assessed, but from what we know of the relative values of measures designed for prevention and treatment, it may be supposed that the public health value of mass radiography is probably at least as important as its individual value.

This statement is subject to the qualification that in pre-mass radiography days the treatment of tuberculosis usually meant the treatment of relatively advanced tuberculosis, and it may be we shall find that the results of treating the earlier disease discoverable by mass radiography will alter our opinions regarding the relative importance of prevention and treatment.

The importance of mass radiography is thus twofold—to protect the public against unsuspected sources of infection, and to assist the individual sufferer by detecting him in the early stage of the disease. In the absence of a clear indication which of these functions is the more important, it will be well to regard them both as important : and if, in issuing propaganda regarding mass radiography one can honestly stress its personal value, one will more readily secure the co-operation of those it is proposed to examine, than would be the case if the propaganda were based chiefly on the value of mass radiography to the public in general.

Value of Mass Radiography to the Public and to the Individual.

From the public health standpoint the important function of mass radiography is the discovery of the infectious case. During the first eight surveys 84 sputum positive cases of pulmonary tuberculosis were found in addition to 10 positive cases already known to the dispensaries, equal to a rate of 1·13 new positive cases per 1,000. This is approximately one quarter of the total cases of significant tuberculosis discovered.

Taking 40,000 examinations per annum as a probable maximum for a single mass radiography unit, our present unit is likely to discover between 40 and 50 positive sputum cases per annum. This figure may be contrasted with the 750 positive cases who come on the registers annually through the ordinary dispensary organisation, and while it is clear that the discovery of a further 40 to 50 positive cases per annum is not a negligible achievement, it is evident that mass radiography as carried out at present does not in any sense supplant the existing tuberculosis service, but rather it supplements it to a modest degree.

In the eight surveys under review, the highest incidence of positive sputum cases occurred in men over 45, but in view of the possible effect of war-time conditions already referred to, it is not proposed to place undue emphasis on this finding.

It is important to remember that for each positive case discovered and segregated, possibly a dozen other persons are saved from daily contact with that source of infection, with the attendant risk of contracting the disease. Hence, although the positive cases found form only about a quarter of the total cases of tuberculosis, their discovery benefits a large number of other persons, and it is for this reason that the public health aspect of mass radiography assumes importance.

It might be argued that since the positive cases are usually those in the relatively advanced stages of the disease, they would sooner or later come to the notice of the dispensaries through the ordinary channels ; but mass radiography detects them and brings them under treatment earlier than would otherwise be the case, and to this extent it must be regarded as a valuable public health measure. The unknown infective case is the danger, for it is uncontrolled and must provide a serious source of infection.

From the personal standpoint the important function of mass radiography is the discovery of the early case, which will quite frequently not be infectious. This function is illustrated by the results obtained in young women, in whom the total incidence of significant tuberculosis was found to be 5·4 per 1,000. Of this number, however, only 0·8 per 1,000 were positive cases, and it is clear that the greater part of the tuberculosis found in young women consisted of early, symptomless disease.

Effect of Mass Radiography on Sanatorium Accommodation.

To benefit the individual, a mass radiography scheme must be linked up with the necessary dispensary organisation and institutional accommodation. At first it was generally believed—though not in Lancashire—that mass radiography would make large demands on sanatorium beds, but this has not been found to be the case. A simple calculation will show the position. Of the 339 cases of significant tuberculosis discovered in the eight surveys, 149 were recommended for sanatorium treatment, equal to a rate of two per 1,000 examinees. Since the total number of examinations in one year is not likely to exceed 40,000, the number of persons requiring sanatorium treatment as a result of mass radiography will probably not exceed 80.

Some of these 80 cases will be county borough residents, whose treatment will be the care of their own authorities. Conversely a few County residents may be discovered to require sanatorium treatment as the result of surveys by Manchester and Liverpool, the only neighbouring authorities possessing mass radiography units. Taking the average period of sanatorium treatment as six months, as was the case in 1945, 30 to 40 beds would suffice for the treatment of County patients discovered by mass radiography. This represents only four to five per cent. of the number of sanatorium beds normally in use, and it appears that the introduction of mass radiography does not at present call for any drastic re-planning of our sanatorium accommodation.

Findings other than Tuberculosis.

Although the primary object of mass radiography is to detect pulmonary tuberculosis, it is to be expected that a number of other abnormal conditions will be found during the routine examination of large numbers of chests. The total number of non-tuberculous findings recorded is 2,379, of whom 437 were referred to their own doctor or a hospital for investigation. The remainder were considered by the medical director of the unit not to require any investigation or treatment.

The nature of the abnormalities for which these 437 patients were referred, together with the fact that they were working and apparently well, makes it unlikely that more than a small proportion of them would be found to require treatment, but the exact number is not known. A brief analysis of these cases is given in the following table :—

Non-Tuberculous Conditions requiring investigation found by Mass Radiography of 74,208 persons.

Cardiovascular conditions	138	
Bronchitis, Bronchiectasis	105	
Pulmonary and Basal Fibrosis ...	56	
Pleural Effusion, Pleural Thickening	29	
Pneumoconiosis	19	
New growth	13	
Other conditions	71	
	437	= 5·9 per 1,000.

A comparison of the distribution of the non-tuberculous diseases in this group with the distribution in the group who were not referred for investigation indicates that the most significant finding is cardiovascular disease, with bronchiectasis taking second place. In most cases it is assumed that treatment, if any, will be palliative rather than radical, and it is considered that the majority of these persons will continue at work without any serious disability. The finding of 5·9 non-tuberculous conditions warranting investigation per 1,000 examinees is not, therefore, regarded as a disturbing event.

Limitations of Mass Radiography.

Most of the limitations of mass radiography are related to the difficulty of getting the apparatus to the people concerned, or the people to the apparatus. On the one hand, it is convenient to work where large groups of people are available for examination ; and on the other hand the apparatus has considerable bulk and weight, which makes it difficult to remove from place to place.

Up to now, it has been found possible to locate the unit at large industrial centres, where it would remain for two or three months until all the workers there had been examined, or as many as were willing to participate. It would then be dismantled, transported, and re-erected at a fresh centre, this work being done by the manufacturers of the apparatus.

It is evident that persons who are well enough to be at work regularly are not necessarily those who will show the highest incidence of tuberculosis. This will rather be found where the predisposing causes of tuberculosis are most in evidence—poverty, malnutrition, overcrowding, and general low standard of living and lack of hygiene. Such persons form a geographical group rather than an industrial group, and in order to reach them by mass radiography it would be necessary to modify our plan of action.

Two courses are possible: either to establish the unit at temporary centres within easy reach of the population it is desired to survey ; or to utilise a mobile unit mounted in a conveyance or conveyances, which could make short period surveys at different places as required. There are difficulties with both these proposals.

The present housing shortage makes it almost impossible to secure a suitable location for the unit in a residential district ; and even if premises could be obtained, the frequent removals involved would introduce undue expense and waste of effort.

With regard to a mobile unit, this would house the X-ray apparatus and provide waiting room accommodation for half-a-dozen persons. It would still be necessary to arrange for the use of three or four rooms on the site where the survey was to take place, but these would not need to be so elaborate as in a fixed centre. At present it is not possible to obtain an electric generator which could be carried in the vehicle to energise the X-ray apparatus, and it would be necessary to utilise the public electric supply. Fairly heavy currents are required, and the necessary installation could not be depended upon to be always available.

Future Developments.

The difficulty, or even impossibility, of adopting either of the methods described in the two preceding paragraphs suggests the desirability of looking for some alternative method to mass radiography for surveying sections of the population other than large industrial groups. The factors which favour the use of mass radiography in factories are replaced by unfavourable factors when its use for non-industrial civilian groups is contemplated, *viz.*, persons cannot be expected to put themselves to any great inconvenience for the purposes of mass radiography, either by way of travelling, attending at appointed times, returning for re-examination, or attending in company with neighbours who may, by inference, obtain

some knowledge of the findings in a particular case. Moreover, in a survey of groups of the general population by invitation, the percentage response in each group would probably be small and selective rather than representative.

I have given careful thought to the possible measures which might be applied to overcome the difficulties enumerated, and I find myself unable to recommend an extension of mass radiography to the general population in any modification of its present mode of use, whether by the provision of a mobile apparatus or otherwise.

As an alternative, it appears preferable to aim at dealing more effectively with the contacts of known tuberculous patients. Our records show that among adult contacts the incidence of tuberculosis is ten times the incidence in the general population, and even if each patient had only one adult contact, the number of cases of tuberculosis discoverable among these contacts would be about 350. It is clear that a system of annual re-examination of contacts would be a relatively simple means of detecting much hidden tuberculosis, especially now that so many of our dispensaries have been provided with X-ray apparatus.

There remains the problem of the relatively small factory with one, two, or three thousand workers. It is not practicable to set up the machinery of mass radiography for factories of this size, owing to the frequent dismantling and re-erection of the apparatus which would be involved, and the uncertainty of suitable accommodation being provided. If a mobile unit were available it would be admirable for this type of work, but for large surveys the disadvantages of a mobile unit make it less suitable than our present unit. The provision of a mobile unit in addition to the present unit would involve considerable expense for the apparatus and a second team of workers, and I do not consider this step justifiable at present.

Instead, I suggest that the X-ray surveying of the smaller industrial concerns, mental hospitals and the like, could be undertaken by means of a portable screening unit such as is used in many of our dispensaries. Three such surveys have already been carried out with entire success by members of the medical staff, apart from the mass radiography unit, on groups of 1,200, 200, and 2,000 persons respectively. The method is simple in its requirements as to apparatus, accommodation and staff, but if it became a frequent practice an additional assistant tuberculosis officer would be required.

Conclusions.

(*a*) Mass radiography discovers approximately one sputum-positive case of pulmonary tuberculosis per 1,000 factory personnel examined. The control and if necessary the segregation of these cases safeguards their daily associates against risk of infection.

(*b*) Mass radiography discovers approximately three early, non-infectious cases of pulmonary tuberculosis per 1,000 factory personnel examined. The sanatorium accommodation required for treating these patients and the positive cases is approximately 30 to 40 beds per mass radiography unit.

(*c*) The discovery of four tuberculous persons per 1,000 factory personnel shows that there is a latent incidence of tuberculosis in the population little less than the known incidence.

(*d*) It is desirable to extend the operation of mass radiography or other intensive method of investigation to groups of the population where unknown cases of tuberculosis are even more likely to be found than in factory personnel.

(*e*) Non-tuberculous conditions of sufficient importance to warrant investigation were found in 5·9 persons per 1,000 examined, but it is not considered that these cases represent a serious medical problem.

Recommendations.

(i) That mass radiography of large groups of factory workers continue to be carried out with the existing apparatus on lines similar to those in use up to the present. The only qualification necessary is that in view of the difficulty sometimes experienced in obtaining suitable dark-room accommodation at a factory, it may be desirable in the near future to consider the provision of a mobile dark-room, consisting of a van or trailer fitted up with the necessary benches, tanks, drying cupboards, safelights, etc.

(ii) That the X-ray surveying of relatively small groups of a few thousand persons at works, offices, hospitals, etc., be undertaken by the dispensary staff as circumstances permit, utilising a portable screening apparatus. These surveys would be supplementary to the Ministry of Health's scheme for the working of mass radiography units. Suitable apparatus is already in use at several of our dispensaries.

(iii) That the detection of tuberculosis in the general population be dealt with in the first place by intensive examination of contacts, and not by inviting groups of persons to present themselves for mass radiography. If, however, convenient groups are readily available, they could be dealt with as in the preceding paragraph.

The Calciferol Treatment of Lupus Vulgaris.

By E. H. W. Deane, M.B., B.S., Consultant Tuberculosis Officer, Wigan County Area.

Lupus vulgaris is a chronic destructive tubercular lesion of the skin which has been treated for many years by various means, chief of which has been ultra-violet light therapy. Good results have been obtained in a considerable number of cases by this treatment supplemented at times by such ancillary measures as spiking the nodules with corrosive substances (*e.g.*, acid nitrate of mercury), or by injection of hydnocarpus oils into the nodules. All these methods have been employed at the Wigan County Dispensary with some measure of success, but we were left with a residuum of cases which were resistant to all measures of treatment as far as effecting a cure was concerned, although in most cases spread of the lesion was prevented.

In December, 1945, Drs. Dowling and Thomas of St. Thomas's Hospital, London, published the results they had obtained by treating the disease with Calciferol in high dosage. Their results were so good that as soon as possible the patients at the Wigan County Dispensary were started on the same treatment, and this report covers the results so far obtained.

Calciferol is an artificially prepared Vitamin D preparation which has been known for many years. The novelty of its use in lupus lies in the very high dosage employed, 150,000 units a day being given in the initial stage of treatment. It is available for this purpose in highly concentrated tablet form of 50,000 units per tablet.

In the earlier cases reported a few patients developed reactions to the treatment; these chiefly consisted of gastric disturbance which, however, rapidly subsided on discontinuance of the drug. Blood calcium estimations were also employed, but no change significant enough to discontinue treatment was found. I have, therefore, thought it unnecessary to undertake these investigations in my patients. No patient in my series has developed any severe reaction; one had a slight transient gastritis and two showed a temporary mild inflammatory reaction in the area of the lupus.

Six cases began treatment in February, 1946, and four more have subsequently been added, so that ten patients have now had the treatment for varying periods up to eight months. This is a considerably shorter time than that on which the original claims were based, and treatment is being continued in a number of cases. So far, however, five cases are completely free of nodules, and of the other five, all are showing varying degrees of improvement (three have had treatment for less than three months). Healing occurs with remarkably little scarring—much less than with any other method of treatment. The treatment is, moreover, much simpler to apply than any of the methods previously used.

The results so far obtained are given in the following table :—

Case No.	Duration of lesion, and extent.	Daily dosage.	Results, etc.
1	36 years.—Orginally whole left forearm and right eyebrow. Former healed except for scattered nodules. Active lesions eyebrow and forehead.	150,000 units reduced to 100,000 in one month	Completely healed in six months.
2	25 years.—Orginally left side face and neck. Healed except for area 1½ in. square on left cheek	150,000 units reduced to 100,000 in one month.	Rapid fading and shrinking with treatment. Healed after eight months
3	22 years.—Lesion left side neck previously healed with light, but reactivated four years ago. 2 in. by 2 in.	150,000 units reduced to 100,000 in one month.	Cleared up rapidly. No nodules after seven months. Healed.
4	44 years.—Left cheek and neck, old lesion with scarring and active nodulation. 2 in. by 2 in.	150,000 units reduced to 100,000 in one month.	Completely healed in eight months.

Case No.	Duration of lesion, and extent.	Daily dosage.	Results, etc.
5	42 years.—Old extensive destructive lesion face with much scarring and active nodules scattered in it.	150,000 units reduced to 100,000 in one month.	All nodules disappeared after eight months. Healed.
6	30 years.—Whole left side face; ear destroyed. Left arm, shoulder to elbow.	150,000 units reduced to 100,000 in one month	Face entirely cleared in six months. Arm—fading rapidly.
7	17 years.—Old lesion left forearm. Many scattered resistant nodules	100,000 units daily	Few nodules only remain.
8	35 years.—Right ear, lobe destroyed; helix involved	100,000 units daily	Shrinking after three months' treatment.
9	Many years.—2 in. by 1 in. area of lupus on side of face.	100,000 units daily	Fading after three months' treatment
10	Over 20 years.—Whole left side face including eyelids. Left ear destroyed. Much scarring.	100,000 units daily	Improving after three months' treatment.

In addition to these cases of lupus, a number of patients suffering from other conditions have been placed on the treatment to see if any improvement could be obtained by this means.

Gland Sinuses.—Three patients with indolent sinuses arising from tubercular glands have been so treated. In two cases rapid healing was obtained; the other shows improvement. As these cases are also having local and general light treatment it is impossible to fix the benefit definitely on the Calciferol treatment, but the clinical impression exists that healing is assisted by its use.

Chest Lesions.—Six patients in the pulmonary wards at Wrightington Hospital have been given the treatment, but no significant change has so far been noted in their cases other than could be attributed to the routine sanatorium treatment.

Other Conditions.—One patient with a sinus arising from a chronic tubercular empyema is receiving treatment, and another with fistulæ-in-ano. The empyema sinus has shown considerable improvement since Calciferol was added to the treatment and is now almost closed. No effect has yet been observed in the fistulæ of the second case.

In one patient with two sinuses arising from the stump of a tubercular ureter after nephrectomy, one of the sinuses healed after six weeks' treatment (100,000 units daily). The other sinus, although not yet healed, is much cleaner.

It seems possible, therefore, that Calciferol will prove of value in lesions other than lupus, although it is too early yet fully to assess its rôle in these other conditions. Further observation is being made including its use in glandular tuberculosis. Of its value in the treatment of lupus itself there can be no doubt.

After-History for Five Years of 2,200 New Cases of Tuberculosis Reported from all Sources in 1940.

From time to time in the past the after-histories of patients treated under the County scheme have been published. In the Annual Report for 1935, by way of change, the after-histories were published of the 2,734 new patients who were reported from all sources during 1930 to be suffering from tuberculosis. The difference between the two sets of data may be explained as follows :—

(i) The after-histories previously dealt with were of patients who had been examined by the tuberculosis officers, accepted as tuberculous, and afforded some form of treatment under the County scheme ;

(ii) The after-histories presented in the 1935 Annual Report related to all known cases of tuberculosis occurring in the Administrative County during 1930, whether they eventually came under the County scheme or not. All these patients had a residential qualification in the Administrative County.

For this report I have had an analysis made, on similar lines, of the 2,200 new cases of tuberculosis reported from all sources in the year 1940. As before, the observation of each living case has been carried to a period of five years after the date when first reported to us as tuberculous. For instance, a case first coming to our notice in May, 1940, has been followed up (if living and still tuberculous) until May, 1945.

The analysis of the cases is again given in the form of a chart, and attention is directed to the following points which arise :—

1.—Of the gross number of new tuberculosis cases coming to knowledge in the Administrative County of Lancaster during 1940, 82·2 per cent. were dealt with under the tuberculosis scheme of the County Council. A further 2·5 per cent. of the gross number related to cases in which the statutory notification was cancelled on the advice of the tuberculosis officer, after several months' observation.

2.—The reasons why 15·2 per cent. of the gross number had not come directly under the County scheme were : (*a*) Cases reported at death only, 4·0 per cent. ; (*b*) cases dying within several weeks (average three weeks) of notification, 6·0 per cent. ; (*c*) cases transferred from another area and found to be recovered, cases in mental hospitals, and cases removing from the County several days after notification, 2·9 per cent. ; and (*d*) patients declining to have treatment under the official County scheme, 2·1 per cent.

3.—In view of the fact that treatment is voluntary, the percentage of 2·1 declining treatment is low. The majority of the 47 patients forming this category have special facilities for proper means of prevention and treatment ; the minority do not wish to submit to the tuberculosis officers' examination, and it is possible that a few of them would not be accepted as tuberculous.

4.—Of the 1,178 pulmonary cases, 71·5 per cent. received one or more periods of sanatorium or hospital treatment ; of the 632 non-pulmonary cases, about nine-tenths received special treatment at a hospital (*e.g.*, orthopædic) or at a dispensary (*e.g.*, artificial light).

CHART

SHOWING THE

AFTER-HISTORY FOR FIVE YEARS

OF 2,200 NEW CASES OF TUBERCULOSIS

REPORTED FROM ALL SOURCES IN 1940.

ADMINISTRATIVE COUNTY OF LANCASTER.

CHART SHOWING THE AFTER-HISTORY FOR FIVE YEARS OF 2,200 NEW CASES OF TUBERCULOSIS REPORTED FROM ALL SOURCES IN 1940.

TOTAL NEW CASES OF TUBERCULOSIS REPORTED FROM ALL SOURCES DURING 1940.

2,200

- Cases reported at death only: 90
- Cases found to be non-tuberculous and notification cancelled: 55
- Cases not dealt with under tuberculosis scheme: 245
  - Transferred from another area and found to be recovered: 10
  - Died from other than tuberculosis: 1
  - Cases in mental institutions, etc.: 15
  - Patients refusing treatment: 47
  - Died several weeks after notification: 133
  - Changed address few days after notification: 39
- NET NUMBER OF NOTIFIED CASES treated under tuberculosis scheme: 1,810

PULMONARY TUBERCULOSIS: 1,178

Males ... 668
Females ... 510

Age 0–14, 43
Age 15–44, 862
Age 45 +, 273

- Received institutional treatment sometime between 1940 and 1945: 843
- Received home treatment and dispensary supervision only: 335

Position at end of five years

- Died from other than tuberculosis: 22
- Died from tuberculosis: 599
  - Period after notification of case
    - Within 12 months: 362
      - 0–3 months: 185
      - 3–6 months: 74
      - 6–9 months: 60
      - 9–12 months: 43
    - 1–2 years: 98
    - 2–3 years: 66
    - 3–4 years: 46
    - 4–5 years: 27
- Removals, untraced, refused further treatment: 151
- Eventually found to be non-tuberculous: 10
- Still under treatment: 396

NON-PULMONARY TUBERCULOSIS: 632

Males ... 307
Females ... 325

Age 0–14, 341
Age 15–44, 240
Age 45 +, 51

About nine-tenths of these patients received special treatment in hospitals or dispensaries

Position at end of five years

- Died from other than tuberculosis: 11
- Died from tuberculosis: 36
  - Period after notification of case
    - Within 12 months: 20
      - 0–3 months: 13
      - 3–6 months: 2
      - 6–9 months: 3
      - 9–12 months: 2
    - 1–2 years: 5
    - 2–3 years: 3
    - 3–4 years: 5
    - 4–5 years: 3
- Removals, untraced, refused further treatment: 74
- Eventually found to be non-tuberculous: 17
- Recovered after three years' quiescence: 323
- Still under treatment: 171

5.—Of the *net* number (1,027) of definite pulmonary cases (removals from area excluded), 58·3 per cent. died from tuberculosis within the five years (35·2 per cent. dying in the first year, 9·5 per cent in the second year, 6·4 per cent. in the third, 4·4 per cent in the fourth, and 2·6 per cent. in the fifth).

6.—The *net* number of definite non-pulmonary cases (removals excluded) was 558; of these, 6·4 per cent. died from tuberculosis within the five years (3·5 per cent. succumbing within the first year). This low percentage reiterates the satisfactory results observed in the 1930 after-histories.

The following table sets out some of the principal findings in the 1930 and 1940 after-history surveys and enables some interesting and useful comparisons to be made :—

	1930.		1940.	
	No.	Per cent.	No.	Per cent.
Total new cases reported from all sources ...	2,734	—	2,200	—
Cases reported at death only	107	3·9	90	4·0
Cases found to be non-tuberculous and notification cancelled	118	4·3	55	2·5
Cases not dealt with under the Tuberculosis Scheme	560	20·4	335	15·2
Net No. of notified cases treated under the Tuberculosis Scheme	2,056	75·2	1,810	82·2
Pulmonary Tuberculosis—				
Net No. of notified cases of pulmonary tuberculosis treated under the Tuberculosis Scheme	1,230	—	1,178	—
Sex : Male	670	54·4	668	56·7
Female	560	45·5	510	43·2
Age-group : 0—14	79	6·4	43	3·6
15—44	874	71·0	862	73·1
45+	277	22·5	273	23·1
After-history for five years—				
Received institutional treatment	855	69·5	843	71·5
Removals, untraced, refused further treatment	133	10·8	151	12·8
Deaths from tuberculosis among pulmonary cases (removals, etc., excluded) ...	693	63·1	599	58·3
Still under treatment	344	27·9	396	33·6

	1930.		1940.	
	No.	Per cent.	No.	Per cent.
Non-Pulmonary Tuberculosis—				
Net No. of notified cases of non-pulmonary tuberculosis treated under the Tuberculosis Scheme	826	—	632	—
Sex : Male	377	45·6	307	48·5
Female	449	54·3	325	51·4
Age-group : 0—14	431	52·1	341	53·9
15—44	334	40·4	240	37·9
45+	61	7·3	51	8·0
After history for five years—				
Removals, untraced, refused further treatment	108	13·0	74	11·7
Deaths from tuberculosis among non-pulmonary cases (removals, etc., excluded)	77	10·7	36	6·4
Recovered after three years' quiescence ...	357	43·2	323	51·1
Still under treatment	224	27·1	171	27·0

It will be observed that the cases coming to light in the 1940 survey showed a marked similarity, in age-group and sex distribution, to those in the 1930 survey.

Fewer patients, notified by practitioners as tuberculous, were found to be non-tuberculous, 55 (2·5 per cent.) in the 1940 group, as against 118 (4·3 per cent.) in the 1930 group ; and more of the 1940 notified cases came under the tuberculosis scheme, 82·2 per cent. as against 75·2 per cent. of the 1930 notified cases.

The mortality for five years from both pulmonary and non-pulmonary tuberculosis among the 1940 cases treated under the tuberculosis scheme was appreciably lower than among the 1930 cases. In the 1930 pulmonary cases, 63·1 per cent. had died within five years of coming to knowledge, whereas in the 1940 group, the percentage was 58·3. The improvement is not due to a difference in the type of patients dealt with in the two periods, since both contained sensibly the same proportion of cases of different severity, as denoted by the Ministry of Health classification.

This saving in mortality is reflected in the larger proportion of patients still under treatment at the end of five years—33·6 per cent. of the 1940 cases as against 27·9 per cent of the 1930 cases. It should be remembered, however, that many of the 396 pulmonary patients classed as still under treatment at the end of five years, would be written off the register as "recovered" in the ensuing (sixth) year. By Ministry of Health

TABLE A.

Dispensary Organisation.

Areas, Medical Staff, Nursing Staff, Dispensaries, and Times of Dispensary Sessions.

January, 1947.

Table A.—List of Tuberculosis Dispensaries in use in January, 1947 and the Tuberculosis Officers for the Dispensary Areas.

DISPENSARY AREA.	DISTRICTS.			Estimated POPULATION 1945.	Area MEDICAL STAFF, January, 1947.	NURSING STAFF.	DISPENSARIES.	Days and Hours of DISPENSARY SESSIONS (Distinct from Home Visiting, attending Sanatoria, Hospitals and Care Committees, etc.).
1	Adlington Blackrod Carnforth Chorley (B.) Chorley (R.) Fulwood Garstang (R.), part of, consisting of parishes of— Barnacre-with-Bonds Bilsborrow	Garstang (R.) *cont.* Bleasdale Cabus Catterall Claughton Forton Garstang Kirkland Myerscough Nateby Nether Wyresdale Winmarleigh	Horwich Lancaster (B.) Lancaster (R.) Leyland Longridge Lunesdale (R.) Morecambe & Heysham (B) Preston (R.) Walton-le-Dale Withnell Acreage 296,020.	265,181	Consultant Tuberculosis Officer— Dr. H. J. Villiers, The Dispensary, 8, Middle Street, Lancaster. Assistant Tuberculosis Officer— Dr. C. V. Stevenson.	Nurse G. M. Hunter Nurse A. Dickinson Nurse I. Wilkinson Nurse N. Ledsham	LANCASTER (Chief), 8, Middle Street (Tel. No. 568). (X-ray and Artificial Light Apparatus). CHORLEY (Branch), 34, St. Thomas's Road (Tel. No. 2763). (X-ray and Artificial Light Apparatus). PRESTON (Branch), 12, Walton's Parade (Tel. No. 2910). (X-ray and Artificial Light Apparatus).	Monday, 10 a.m. Other days and evenings by appointment. Tuesday, 10 a.m. Other days and evenings by appointment. Wednesday, 10 a.m. Other days and evenings by appointment.
2	Accrington (B.) Bacup (B.) Barrowford Blackburn (R.) Brierfield Burnley (R.) Church	Clayton-le-Moors Clitheroe (B.) Clitheroe (R.) Colne (B.) Darwen (B.) Great Harwood Haslingden (B.)	Nelson (B.) Oswaldtwistle Padiham Rawtenstall (B.) Rishton Trawden Turton Acreage 177,025.	286,464	Consultant Tuberculosis Officer— Dr. G. B. Charnock, The Dispensary, High Lea, 108a, Whalley Road, Accrington. Assistant Tuberculosis Officers— Dr. R. Stalker. Dr. H. N. Bleasdale.	Nurse W. Hall Nurse M. Haworth Nurse L. Ennis Nurse E. H. Scott Nurse S. Midgley Nurse E. C. Watterson	ACCRINGTON (Chief), High Lea, 108a, Whalley Road (Tel. No. 2443). (X-ray and Artificial Light Apparatus). DARWEN (Branch), 20, Railway Road (Tel. No. 408). NELSON (Branch), 64, Carr Road (Tel. No. 507). (Artificial Light Apparatus). STACKSTEADS (Branch), Knott Hill House (Tel. No. Bacup 201). (Artificial Light Apparatus).	Tuesday, 1-30 p.m. Wednesday, 1-30 p.m. Monday, 10 a.m. Tuesday, 1-30 p.m. Friday, 10-30 a.m. Friday, 10 a.m.
	Blackburn (C.B.)		Acreage 8,080.	102,590		Nurse M. Evans	BLACKBURN, 40, Duke Street (Tel. No. 6644). (X-ray and Artificial Light Apparatus).	Monday, 9-30 a.m. to 12 noon and 1-30 to 3-30 p.m. by appointment. Wednesday, 10 a.m. to 12 noon by appointment. 1-30 to 3-30 p.m., X-ray exams., by appointment.
3	Ashton-under-Lyne (B.) Audenshaw Chadderton Crompton Denton Droylsden Failsworth Heywood (B.)	Lees Limehurst (R.) Littlehorough Middleton (B.) Milnrow Mossley (B.) Prestwich (B.) Radcliffe (B.)	Ramsbottom Royton Tottington Wardle Whitefield Whitworth Acreage 81,801.	361,982	Consultant Tuberculosis Officer— Dr. G. Fletcher, The Dispensary, Lees Street, Ashton-under-Lyne. Assistant Tuberculosis Officers— Dr. E. Clifford-Jones. Dr. P. J. H. Clarke.	Nurse W. Swift Nurse M. Sherwen Vacancy Nurse L. M. Krogman Nurse G. E. Crehhin Nurse A. Flynn Nurse N. D. Hanmer	ASHTON-UNDER-LYNE (Chief), Lees Street (Tel. No. 1775). (X-ray and Artificial Light Apparatus). CHADDERTON (Branch), Brook Street (Tel. No. Main 1671). (X-ray Apparatus). RADCLIFFE (Branch), 41, Darhyshire Street (Tel. No. 2323). (X-ray and Artificial Light Apparatus). ROCHDALE (Branch), 168, Drake Street (Tel. No. 3892).	Monday, 10 a.m., X-ray exams. Tuesday, 2 p.m. Friday, 10 a.m. 1st Tuesday of month, 6-30 p.m. Monday, 2 p.m. Wednesday, 10 a.m. 2nd Monday of month, 6-30 p.m. Wednesday, 2 p.m. 3rd Wednesday of month, 6-30 p.m. Thursday, 10-30 a.m. 2nd Thursday of month, 6-30 p.m.
4	Atherton Eccles (B.) Farnworth (B.) Golborne Irlam Kearsley	Leigh (B.) Little Lever Stretford (B.) Swinton and Pendlebury (B.) Tyldesley	Urmston Westhoughton Worsley Acreage 58,029.	353,104	Consultant Tuberculosis Officer— Dr. J. L. Armour, The Dispensary, 13, Church Street, Leigh. Assistant Tuberculosis Officers— Dr. W. Fettes. Dr. P. E. Cosgrove.	Nurse A. Boardman Nurse H. M. Shakespeare Nurse M. Gibson Nurse D. Hexter Nurse F. G. Smith Nurse M. B. Jones Nurse K. Blakemore	LEIGH (Chief), 13, Church Street (Tel. No. 258). (X-ray Apparatus). ECCLES (Branch), 28 & 30, Gilda Brook Road (Tel. No. 3533). (X-ray and Artificial Light Apparatus). FARNWORTH (Branch), 19–23, Darley Street (Tel. No. 63). PENDLEBURY (Branch), 121, Station Road (Tel. No. Swinton 1895). STRETFORD (Branch), 14, Derhyshire Lane (Tel. No. Longford 2010).	Wednesday, 10 a.m. Friday, 10 a.m. 2nd Thursday of month, 6-30 p.m. Tuesday, 2 p.m.; 2-30 p.m., X-ray exams. Thursday, 2-30 p.m., X-ray oxams. Friday, 10 a.m.; 2-30 p.m., X-ray exams. 1st Wednesday of month, 6-30 p.m. Tuesday, 10 a.m. Friday by appointment. 3rd Thursday of month, 6-30 p.m. Monday, 2 p.m. Last Thursday of month, 6-30 p.m. Tuesday, 10 a.m. Thursday, 10 a.m. Last Monday of month, 6-30 p.m.
5	Crosby (B.) Formby Haydock Huyton-with-Rohy Litherland	Newton-le-Willows Ormskirk Prescot Rainford Skelmersdale	Warrington (R.) West Lancashire (R.) Whiston (R.) Widnes (B.) Acreage 168,847.	329,198	Consultant Tuberculosis Officer— Dr. C. Berry, The Dispensary, "Ellesmere," Crosby Road North, Waterloo. Assistant Tuberculosis Officers— Dr. D. O. Hughes. Dr. P. Haslam.	Nurse M. J. McKeown Nurse E. M. Crone Nurse M. A. Judge Nurse L. Farquhar Nurse A. E. Webster Nurse A. K. Rayner	WATERLOO (Chief), "Ellesmere," Crosby Road North (Tel. No. Waterloo 688). (X-ray and Artificial Light Apparatus). HUYTON (Branch), 14, Blue Bell Lane (Tel. No. 383). (X-ray and Artificial Light Apparatus). ST. HELENS (Branch), 90, Hardshaw Street (Tel. No. 3916). (Artificial Light Apparatus). WIDNES (Branch), Chapel Street (Tel. No. 2156). (X-ray and Artificial Light Apparatus).	Monday, 2 p.m. Wednesday, 2 p.m. Evenings by appointment. Tuesday, 2 p.m. Thursday, 2 p.m. Evenings by appointment. Tuesday, 2 p.m. Evenings by appointment. Monday, 10 a.m. to 12 noon. Friday, 2 to 4 p.m. Evenings by appointment.
Furness	Dalton-in-Furness Grange-over-Sands	Ulverston	Ulverston (R.) Acreage 140,549.	39,210	Consultant Tuberculosis Officer— Dr. G. Leggat, High Carley Sanatorium, near Ulverston (Tel. No. Ulverston 2304).	Nurse F. M. Cummings	ULVERSTON, 69, Albion Place, Lighthurn Avenue (Tel. No. 2145). (Artificial Light Apparatus). (X-ray Apparatus at High Carley Sanatorium).	Tuesday, 10 a.m. Thursday, 10 a.m.
Fylde	Fleetwood (B.) Fylde (R.) Garstang (R.), part of, consisting of parishes of— Great Eccleston Hambleton	Garstang (R.) *cont.* Inskip-with-Sowerby Out Rawcliffe Pilling Stalmine-with-Stainall Upper Rawcliffe	Kirkham Lytham St. Annes (B.) Poulton-le-Fylde Preesall Thornton Cleveleys Acreage 74,441.	95,405	Consultant Tuberculosis Officer— Dr. A. B. Jamieson, Elswick Sanatorium, near Kirkham. Assistant Tuberculosis Officer— Dr. J. N. Parker (2 days per week)	Nurse E. Watterson	FLEETWOOD. 23, Poulton Road (Tel. No. 282). (X-ray and Artificial Light Apparatus). ELSWICK Sanatorium, near Kirkham (Tel. No. Great Eccleston 22). (X-ray Apparatus).	Tuesday, 9 a.m. Wednesday, 2 to 3 p.m. by appointment.
Wigan County	Ahram Ashton-in-Makerfield Aspull Billinge & Winstanley	Hindley Ince-in-Makerfield Orrell Standish-with-Langtree	Upholland Wigan (R.) Acreage 40,950. Total acreage of — Admin. County 1,037,682 Blackburn ... 8,080	101,876 1,832,420 102,590	Consultant Tuberculosis Officer— Dr. E. H. W. Deane, Wrightington Hospital, Appley Bridge, near Wigan, (Tel. No. Appley Bridge 338).	Nurse E. Walters Nurse M. J. Evans	WIGAN, 3, Mesnes Park Terrace (Tel. No. 3172). (X-ray and Artificial Light Apparatus).	Monday, 9-30 a.m. Thursday, 9-30 a.m. Evenings by appointment.

TSC. 47/6965.

TUBERCULOSIS DEPARTMENT,
COUNTY OFFICES,
PRESTON. (Tel. 4808).

Mass Radiography Unit.

Medical Director ... ... Dr. J. N. Parker.
Organising Secretary ... ... Mr. A. L. Wright.
Senior Radiographer ... ... Miss W. M. Kent.

F. C. S. BRADBURY,
Central Consultant Tuberculosis Officer.

instructions a case of pulmonary tuberculosis may only be written off as " recovered " if the disease has been quiescent for two years and arrested for a further three years. During 1945, 226 pulmonary cases were so written off.

Turning to the non-pulmonary cases, it is seen that 10·7 per cent. of the 1930 group had died before the expiration of five years, whereas only 6·4 per cent. of the 1940 group had succumbed in a like period. Here, the saving in mortality is accompanied by an increased proportion of patients written off the register as " recovered "—51·1 per cent. of the 1940 cases as against 43·2 per cent. of the 1930 cases. It should be noted that a non-pulmonary case may be written off the register as " recovered " if arrest of the disease has been maintained for at least three years.

The results observed in this survey are satisfactory, especially in view of the fact that the five years under review were the most difficult in history from an economic and social point of view.

The Present Lancashire Scheme.

The Administrative County is divided into five large areas, average population 320,000, and three small areas. Each large area is in the charge of a *team* consisting of consultant tuberculosis officer, one or more assistant tuberculosis officers, four to seven tuberculosis health visitors, and clerical staff of two. In each of these areas there is a chief dispensary, two or more branch dispensaries, and a sanatorium-hospital containing up to 70 beds for the treatment and isolation of patients near their homes ; the consultant tuberculosis officer of the dispensary area acts as the visiting medical superintendent of the sanatorium-hospital.

There are three small dispensary areas, and two of them are in the charge respectively of the medical superintendent of the High Carley Sanatorium (154 beds) and the Elswick Sanatorium (70 beds). Owing to the increase in the number of beds at the Wrightington Hospital, which now total 371, a new arrangement was made whereby the tuberculosis officer in charge of the dispensary area adjoining Wrightington is in clinical charge of beds at this large hospital. The tuberculosis officer has been appointed visiting physician to the pulmonary section of the Wrightington Hospital consisting of 74 beds.

All our senior or consultant tuberculosis officers thus have institutional beds like consultants in other branches of medicine, and I lay great stress on this combination of the hospital, dispensary and domiciliary sides of the work because it enables the problem of the prevention and treatment of tuberculosis to be seen whole.

Co-operation with County Boroughs and the Isle of Man.

The County Council, by agreement with the Blackburn County Borough Council, undertook responsibility for the Borough tuberculosis scheme as from the 1st July, 1944.

Blackburn has consequently been assimilated in Dispensary Area 2, raising the population of 286,464 by 102,590. Dr. G. Barker Charnock, the consultant tuberculosis officer for Area 2, is, therefore, responsible for the tuberculosis scheme in the Borough, including X-ray examinations, artificial light treatment, A.P. refills, etc. During 1945, 404 new Borough cases were examined. At the end of the year there were 424 patients on the Blackburn dispensary register, of whom 43 were undergoing institutional treatment.

The financial arrangements, which are subject to amendment by mutual agreement, provide for the Borough Council to re-imburse the County Council for dispensary treatment and supervision and for Central Office expenses on a population basis. For the institutional treatment of Blackburn patients, the Corporation administer their Park Lee Hospital (32 beds for pulmonary cases) and bear the cost thereof. Otherwise, the institutional accommodation required for Borough patients is provided by the County Council, the Corporation paying the operative maintenance rate at the institutions concerned.

The agreement is for a period of three years and is thereafter determinable by 12 months' notice on either side.

Co-operation on sections of the tuberculosis scheme, *e.g.*, institutional treatment, major thoracic surgery, artificial pneumothorax refills, exists with several of the Lancashire County Boroughs, namely, Southport, Bootle, Preston, etc., and with the Isle of Man Local Government Board.

With regard to the last-named, one of our tuberculosis officers (Dr. J. L. Armour) visits the island monthly to examine patients and to supervise their treatment at the dispensary and the sanatorium; Manx patients requiring specialised treatment are sent to our Lancashire institutions.

Maintenance Allowances for Tuberculous Patients and their Dependants.

The Government scheme for tuberculosis authorities to grant allowances to certain classes of patients suffering from pulmonary tuberculosis and their dependants was put into operation in the Administrative County (*a*) on the 14th June, 1943, for maintenance allowances, and (*b*) on the 28th June, 1943, for discretionary allowances and special payments.

The following statement shows the work done during 1945 in respect of County and Blackburn patients :—

Applications received.	Maintenance Allowances.	Discretionary Allowances.	Special Payments.
Eligible and assessment made...	713	156	53
Ineligible according to conditions of Memo. 266/T of Ministry of Health	126	109	34
Total	839	265	87

Average grant per week in 1945, per eligible applicant :

	£	s.	d.
Maintenance allowances (including winter fuel) ...	1	6	0
Discretionary allowances	0	3	7
Special payments (excluding free travel vouchers) ...	0	6	8

Total net amount of allowances paid to patients or dependants during the year 1945 (excluding Blackburn County Borough) :—

Maintenance allowances	49,406	16	11
Discretionary allowances	1,318	14	2
Special payments	539	8	3
	£51,264	19	4

Total number of individual patients in receipt of allowances of one kind or another on the 31st December, 1945 ... 649

On the 1st August, 1946, there were 615 individual patients (County 584, Blackburn 31) receiving allowances—Maintenance allowances 600, discretionary allowances 184, special payments 24.

The allowances have proved successful so far as they go, but experience showed that they were inadequate, particularly for children. The Ministry of Health were urged to increase the rates, and they have now agreed to an improved scale for children. The new rates came into operation on the 16th December, 1946.

Work of the Dispensary Organisation.

Attention is drawn in the following statement to the very large increases in new cases examined, X-ray examinations, and artificial pneumothorax refills when the years 1945 and 1935 are compared. The increase in new cases reflects the ever-growing use made by general practitioners of our consultant physicians for all kinds of chest complaints, tubercular and non-tubercular. Increases in artificial pneumothorax refills are a measure of the importance of surgery in the treatment of pulmonary tuberculosis :—

	1935.	1944.	1945.
New cases examined	4,291	7,426	7,006
New contacts examined	917	1,579	1,773
Re-examinations of "old" patients and "old" contacts	23,409	31,621	33,103
Patients' attendances at dispensaries	23,813	37,544	39,583
Visits by tuberculosis officers to patients' homes	4,804	3,082	2,299

	1935.	1944.	1945.
X-ray examinations made in connection with dispensary work	10,024	24,441	28,271
Sputum examinations made in connection with dispensary work ...	6,767	9,771	9,420
Artificial pneumothorax refills given at the dispensaries	2,233	6,717	7,749
Pneumoperitoneum refills given at the dispensaries	—	—	13
Patients' dispensary attendances for artificial light treatment	26,323	19,709	15,012
Consultations with medical practitioners—			
Personal	618	344	369
Other	5,404	8,575	8,608
Examinations of persons referred by Medical Boards under the National Service (Armed Forces) Act, 1939 ...	—	612	474
Examinations of entrants to industry under the Sandstone (Silicosis) Scheme, 1929	38	2	1
Visits by tuberculosis health visitors to patients' homes	39,823	36,929	34,092

All this work has gone on, increasing in amount throughout the war; it is a measure of what has been done for the prevention and treatment of tuberculosis and a very big contrast with what was done in the previous war.

A more detailed return of some of the work of the dispensaries shown above during the year 1945 is given on page 44.

Thoracic Surgery.

The treatment of pulmonary tuberculosis relies on thoracic surgery to an ever-increasing extent, and our Lancashire scheme is no exception to this generalisation.

Mr. H. Morriston Davies, who was for many years our senior thoracic surgeon, has been succeeded by Mr. F. Ronald Edwards. Mr. Davies now occupies the post of consultant adviser in thoracic surgery, and continues to hold monthly clinics at the County Offices, Preston, at which the tuberculosis medical staff of the County—and occasionally of other areas—meet and discuss their difficulties under Mr. Davies' guidance.

At the dispensaries a great many refills for artificial pneumothorax treatment are carried out. Thus at the end of 1945, 332 patients were receiving artificial pneumothorax treatment at the dispensaries and refills for the year totalled 7,749; in addition, 13 pneumoperitoneum refills were given.

The following statement shows the amount of thoracic surgery done at our institutions, and the big increase during 1945 compared with the average for the preceding three years :—

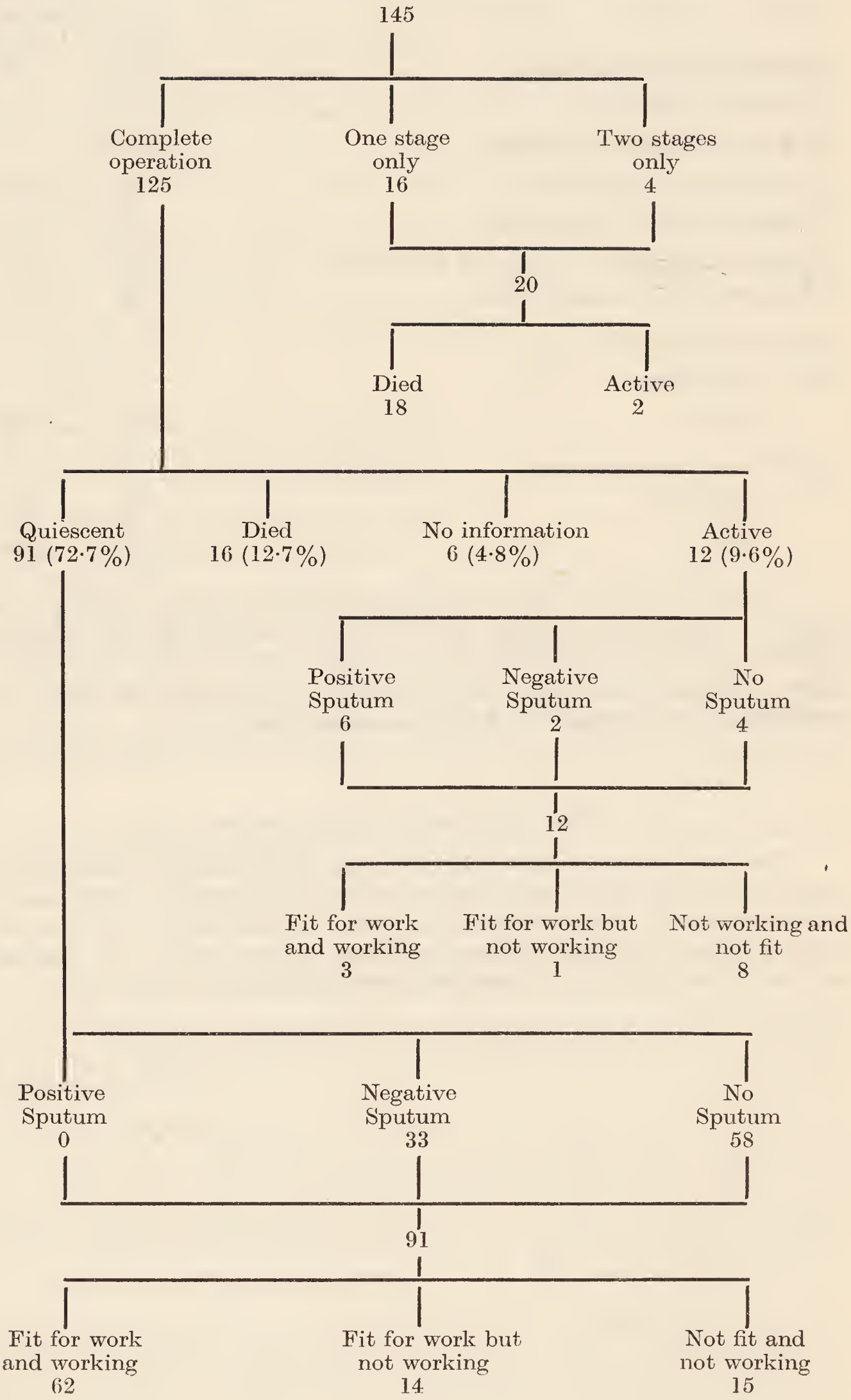
	1945.	3-year average 1942–44.
Thoracoplasty operations	110	59
Monaldi operations	2	3
Extra-pleural pneumothorax	2	1
Phrenic nerve operations	31	60
Thoracoscopy examinations	62	50
Thoracoscopy and division of adhesions ...	134	79
Bronchoscopy examinations	24	17
Pneumoperitoneum—		
Inductions	13	8
Refills	256	153
Artificial pneumothorax—		
Inductions	323	277
Refills	7,085	6,741

A census of the 5,223 pulmonary patients (adults, children, males, females, early, intermediate and advanced stages) on the dispensary registers at the end of 1945 showed that 1,592, or 30·4 per cent., had either received major or minor surgical treatment for their chest condition or such treatment had been attempted.

Thoracoplasty.—After-histories.

The first thoracoplasty operation at High Carley Sanatorium was performed by Mr. Morriston Davies in 1933, and year by year since then thoracic surgical work at the Sanatorium has increased. By the end of 1945, 145 patients had undergone thoracoplasty and been discharged, and the following schema shows the results achieved in these cases :—

Thoracoplasty patients discharged from
High Carley Sanatorium from
1933 to the end of 1945



The most outstanding features of this diagram are that, of the 125 patients who had the complete operation, 91 (72·7 per cent.) were quiescent at the end of 1945.

It is also worthy of note that 76 (83 per cent.) of the 91 quiescent cases were fit for work at the end of 1945, and 62 (68 per cent.) were actually working. In addition, four of the active cases were fit for work, three of them being at work.

Non-Tuberculous Chest Conditions.

Non-tuberculous chest cases, *e.g.*, carcinoma, empyema, abscess, bronchiectasis, aneurism, are sent in the first instance by general practitioners to the dispensaries where they are examined and reported on by the County tuberculosis medical staff, and, if necessary, the cases are discussed at the clinic described above. Then, after confirmation by Mr. Morriston Davies, arrangements may be made on behalf of the County Medical Officer of Health for treatment by Mr. Davies at the Chest Centre, Broadgreen Hospital, Liverpool. Alternatively, for any urgent case the tuberculosis officer makes direct communication with Mr. Davies.

Below are given the numbers of such patients admitted during 1945, together with the diagnoses :—

Bronchiectasis, 26 ; bronchiolitis, 1 ; bronchitis, 2 ; bronchial carcinoma, 10 ; carcinoma of lung, 2 ; empyema, 1 ; foreign body in lung, 1 ; gangrene of lung, 1 ; mediastinal cyst, 1 ; neuro-fibroma, 2 ; pneumonitis, 2 ; retro-sternal thyroid, 1 ; segmental collapse, 1 ; thyroid tumour, 1 ; malignant thyroid tumour, 1 ; hæmoptysis, 1.

X-ray Examinations.

X-ray apparatus is provided for the consultant tuberculosis officer of each area at his institution and at one or more dispensaries ; of the 24 dispensaries, 15 are equipped with X-ray apparatus.

Below is given the X-ray work done in 1945 compared with 1935 and 1944 :—

	Screen Examinations.			Skiagrams.		
	1935	1944	1945	1935	1944	1945
At dispensaries	3,464	11,500	14,244	6,560	12,941	14,027
At sanatoria and hospitals	4,857	10,509	8,365	4,371	6,679	6,271

Mass Miniature Radiography.

The Lancashire mass miniature radiography unit commenced operations in October, 1943, being the first among the local authorities in the country. The system of working, the staff, and the description of the apparatus were given in the annual report for 1943, and a report on the results so far obtained will be found on pages 18 to 27.

Dr. J. N. Parker took over the duties of Medical Director on the 8th November, 1946, in succession to Dr. D. O. Hughes, who has resumed normal duties as an Assistant Tuberculosis Officer after completing his tour of duty with the miniature radiography unit.

Examination of Recruits.

The civilian medical boards, set up under the National Service (Armed Forces) Act, 1939, for the examination of recruits, co-operate with local authorities by sending men and women suspected to be suffering from tuberculosis to the tuberculosis officers for a special examination, including X-ray.

The following table shows the number of recruits examined by the County tuberculosis officers during the years 1940–45.

	1940	1941	1942	1943	1944	1945
Total number of recruits referred by medical boards	614	868	861	912	612	474
Number of above who were known to the County tuberculosis officers ...	78	131	163	103	80	52
Net number of recruits examined by County tuberculosis officers for first time	536	737	698	809	532	422
Number found to be suffering from tuberculosis—						
Active cases	27 (*5·0%*)	15 (*2·0%*)	15 (*2·1%*)	18 (*2·2%*)	7 (*1·3%*)	7 (*1·6%*)
Quiescent cases	15 (*2·7%*)	19 (*2·5%*)	4 (*0·5%*)	1 (*0·1%*)	7 (*1·3%*)	3 (*0·7%*)
Number not previously known to County tuberculosis officers but who had received treatment under another authority—						
Active cases	3	3	3	6	2	—
Quiescent cases	—	6	8	3	1	3

The total number of recruits examined by the medical boards during this period is not known.

Pathological Laboratory.

This laboratory at the High Carley Sanatorium, opened in March, 1942, was established for the Emergency Hospital Service and the Public Health Service in the Furness area, including Barrow-in-Furness.

For providing these laboratory facilities the County Council charge a nominal rental; certain pathological work connected with the County tuberculosis scheme is carried out at the laboratory without charge.

During 1945 a total of 9,031 specimens were examined.

Tuberculous Pensioners.

Of the 8,151 patients under the supervision of the dispensary staff at the end of 1945, 652 were persons discharged from H.M. Forces and (from January, 1943) the Merchant Navy, whose disease was held by the Ministry of Pensions to be attributable to war service (22 being in respect of the 1914–18 War).

The cost of their institutional treatment and travelling expenses to and from institutions is met out of the funds of the Ministry of Pensions, to whom detailed claims for refund are accordingly submitted from time to time.

Tuberculous Service Cases.

A modification has been made by the Ministry of Health concerning the discharge of members of H.M. Forces who require to be retained in hospital after invaliding has been recommended.

Formerly, members of the Forces detained in hospital were eligible to be retained in the Services for a period of eight months from the date of first absence from duty on account of the disability.

This period of eight months, where the disability is accepted as attributable to or aggravated by service, will be extended until medical or surgical finality is reached, subject to a maximum period of 30 months.

The result of this modification is that respective Service Departments will now be responsible for the maintenance and treatment of tuberculous Service cases up to a maximum period of 30 months from the date of first absence from duty on account of the disability.

This extension from eight to 30 months is financially favourable to the County Council.

Institutional Accommodation and Waiting List.

For the year 1945 the average accommodation for *County* patients at tuberculosis institutions was as follows: Pulmonary tuberculosis 790 beds, non-pulmonary tuberculosis 232 beds, total 1,022.*

When the necessary nursing and domestic staff is available, further beds at the Wrightington Hospital can be brought into use.

From time to time, when there are no suitable patients on the County waiting list, beds are let to county borough councils. During 1945 the average number of beds let to other authorities, including H.M. Forces, was: Pulmonary 132, non-pulmonary 31.

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* This figure is exclusive of the beds occupied by Blackburn patients.

In relation to population and deaths, the 1,022-bed accommodation provides the following :—

Pulmonary tuberculosis	... 1 bed per 2,319 of the population or 111 beds per 100 pulmonary deaths.
Non-pulmonary tuberculosis	... 1 bed per 7,898 of the population, or 144 beds per 100 non-pulmonary deaths.

The waiting list, averaged at monthly periods during the year, was as follows :—

Pulmonary tuberculosis	... Males 64, females 37.
Non-pulmonary tuberculosis	... Males 26, females 13.

The position in December, 1945, was : Pulmonary tuberculosis—males 62, females 16 ; non-pulmonary tuberculosis—males 22, females 22. For interest the figures for December, 1946, were : Pulmonary—males 91, females 21 ; non-pulmonary—males 10, females 4 ; total, 126.

To eliminate the waiting list for pulmonary tuberculosis more beds are required. It would appear that the position would be met by the provision of a new sanatorium (with a major thoracic unit) to contain 150 to 200 beds and centrally situated. For non-pulmonary tuberculosis, additional beds—preferably at the Wrightington Hospital—are required. The number will depend on future arrangements with the county boroughs.

By an extension of the arrangement with the Aspull, Blackrod, Horwich and Westhoughton Joint Hospital Board, further beds have been obtained at the Fall Birch Isolation Hospital, Lostock, near Bolton, for female patients suffering from pulmonary tuberculosis. In December, 1946, there were 55 beds available at the hospital—a substantial addition to our hospital accommodation.

During the year, 1,467 County patients suffering from pulmonary tuberculosis were admitted to sanatoria and pulmonary hospitals, 1,262 were discharged, and 189 died in the institutions ; in addition, 59 observation cases were admitted, 58 were discharged, and one died from a non-tuberculous disease.

Admissions of County patients suffering from non-pulmonary tuberculosis to general and special hospitals during 1945 totalled 306, the discharges numbered 307, and 22 patients died in the institutions ; 50 observation cases were also admitted, and 48 were discharged.

Cost of the Tuberculosis Scheme.

The total estimated expenditure (including dispensaries, institutional accommodation, mass miniature radiography, maintenance allowances, Blackburn C.B. work, and administrative expenses) was £371,094.

The estimated income (including £23,000 from the Government funds for tuberculous ex-servicemen, £52,500 from the Government for maintenance allowances, and £9,400 from Blackburn C.B.) was £104,380.

The estimated net expenditure for 1946–47, therefore, is £266,714, equal to £145 per 1,000 of the population and an equivalent rate in the pound of 5·69d.

Co-operation with Medical Practitioners.

Co-operation with the medical practitioners and the medical officers and sanitary inspectors of County district councils continues most cordial and satisfactory. Of the "new" persons (excluding contacts) examined during 1945, 96 per cent. were referred by medical practitioners, etc., to the tuberculosis officers for an opinion as to diagnosis.

F. C. S. BRADBURY,
Central Consultant Tuberculosis Officer.

County Offices, Preston,
10th January, 1947.

APPENDIX I.

(*a*) Return showing the Work of the County Dispensaries during the year 1945.

Diagnosis.	Pulmonary.				Non-Pulmonary.				Total.				Grand Total.
	Adults.		Children.		Adults.		Children.		Adults.		Children.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
A.—New Cases examined during the year (excluding contacts) :—													
(*a*) Definitely tuberculous	529	494	23	19	78	213	134	107	607	707	157	126	1,597
(*b*) Diagnosis not completed	—	—	—	—	—	—	—	—	25	19	14	10	68
(*c*) Non-tuberculous ...	—	—	—	—	—	—	—	—	2,077	2,217	589	458	5,341
B.—Contacts examined during the year :—													
(*a*) Definitely tuberculous	11	11	6	4	—	9	1	1	11	20	7	5	43
(*b*) Diagnosis not completed	—	—	—	—	—	—	—	—	—	1	2	3	6
(*c*) Non-tuberculous ...	—	—	—	—	—	—	—	—	323	631	385	385	1,724
C.—Cases written off the dispensary registers as :—													
(*a*) Recovered	110	109	5	2	129	148	101	92	239	257	106	94	696
(*b*) Non-tuberculous (including any such cases previously diagnosed and entered on the dispensary registers as tuberculous)	—	—	—	—	—	—	—	—	2,408	2,852	976	845	7,081
D.—Number of Cases on dispensary registers on 31st December, 1945 :—													
(*a*) Definitely tuberculous	2,845	2,254	72	52	709	967	674	578	3,554	3,221	746	630	8,151
(*b*) Diagnosis not completed	—	—	—	—	—	—	—	—	25	18	16	13	72

1.—Number of cases on dispensary registers on 1st January, 1945	8,036	8.—Number of visits by tuberculosis officers to homes (including personal consultations)	2,299
2.—Number of cases transferred from other areas and cases returned after discharge under Head 3 in previous years	233	9.—Number of visits by nurses or health visitors to homes for dispensary purposes ...	34,092
3.—Number of cases transferred to other areas, cases not desiring further assistance under the tuberculosis scheme, and cases "lost sight of"	333	10.—Number of :—	
4.—Cases written off during the year as dead (all causes)	715	(*a*) Specimens of sputum, etc., examined ...	8,566
5.—Number of attendances at the dispensaries (including contacts)	39,583	(*b*) X-ray examinations made in connection with dispensary work	28,271
6.—Number of insured persons under domiciliary treatment on the 31st December, 1945	1,635	11.—Number of "recovered" cases restored to dispensary registers, and included in A (*a*) and A (*b*) above	34
7.—Number of consultations with medical practitioners :—		12.—Number of "T.B. plus" cases on dispensary registers on 31st December, 1945	3,446
(*a*) Personal	369		
(*b*) Other	8,608		

Number of dispensaries for the treatment of tuberculosis (excluding centres used only for special forms of treatment).

Provided by the Council ... ... 24 | Provided by Voluntary Bodies ... Nil.

Number of examinations of persons referred by Civilian Medical Boards under the National Service (Armed Forces) Act, 1939	474
Number of examinations of entrants to industry under Sandstone (Silicosis) Scheme, 1929	1
Number of visits by tuberculosis officers to sanatoria, and pulmonary, special, and public assistance hospitals	309
Number of special visits by tuberculosis officers, *i.e.*, interviews with medical officers of health, hospital officials	106

(*b*) Return showing the Work of the Blackburn Dispensary during the year 1945.

Diagnosis.	Pulmonary.				Non-Pulmonary.				Total.				Grand Total.
	Adults.		Children.		Adults.		Children.		Adults.		Children.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
A.—(1) Number of definite cases of Tuberculosis on the Dispensary Register on 1st January, 1945 ...	218	143	13	8	21	33	45	17	239	176	58	25	498
(2) Transfers from other Authorities during the year	3	4	—	—	—	—	—	3	3	4	—	3	10
(3) Lost sight of cases returned during the year	—	—	—	—	—	—	—	—	—	—	—	—	—
B.—Number of New Cases diagnosed as tuberculous during the year :—													
(1) Class T.B. Minus ...	24	8	—	1	—	—	—	—	24	8	—	1	33
(2) Class T.B. plus ...	20	10	—	—	—	—	—	—	20	10	—	—	30
(3) Non-pulmonary ...	—	—	—	—	8	4	3	7	8	4	3	7	22
C.—Number of cases included in A and B written off the Dispensary Register during the year as :—													
(1) Recovered	25	27	4	5	6	13	11	11	31	40	15	16	102
(2) Dead (all causes) ...	17	11	1	—	—	—	1	—	17	11	2	—	30
(3) Removed to other Areas	5	—	—	—	3	—	—	2	8	—	—	2	10
(4) For other reasons ...	10	8	1	—	2	3	1	2	12	11	2	2	27
D.—Number of definite cases of Tuberculosis on the Dispensary Register on 31st December, 1945 ...	208	119	7	4	18	21	35	12	226	140	42	16	424

APPENDIX II.

CENSUS OF TUBERCULOSIS CASES on the County dispensary registers on the 31st December, 1945 (inclusive of 972 patients in sanatoria and hospitals).

Dispensary area.	Sex.	Number of cases under supervision on 31/12/45.							Number of doubtful cases on 31-12-45
		Pulmonary tuberculosis.		Non-pulmonary tuberculosis.		Total.	Number of cases per 1,000 of population.		
		Under 15 years of age.	15 years and over.	Under 15 years of age.	15 years and over.		Pulmonary	Non-pulmonary	
No. 1	M.	17	310	106	68				
	F.	3	247	94	126	971	2·17	1·48	15
No. 2	M.	7	369	89	107				
	F.	8	247	88	161	1,076	2·20	1·55	4
No. 3	M.	12	636	85	161				
	F.	13	473	85	188	1,653	3·13	1·43	21
No. 4	M.	8	579	110	163				
	F.	5	469	71	199	1,604	3·00	1·53	1
No. 5	M.	9	537	126	102				
	F.	5	463	109	126	1,477	3·08	1·40	10
Furness ...	M.	7	91	27	22				
	F.	5	80	23	35	290	4·66	2·72	3
Fylde	M.	2	157	43	35				
	F.	2	119	30	36	424	2·93	1·50	6
Wigan County ...	M.	10	166	88	51				
	F.	11	156	78	96	656	3·36	3·07	12
Total ...	M.	72	2,845	674	709				
	F.	52	2,254	578	967	8,151	2·85	1·59	72
		5,223		2,928			4·44		

The populations of the dispensary areas were :—

Area 1	265,181	Area 5	329,198
Area 2	286,464	Furness	39,210
Area 3	361,982	Fylde	95,405
Area 4	353,104	Wigan County ...	101,876

Total for County ... ... 1,832,420.

APPENDIX III.

Analysis of Cases on the County dispensary registers on the 31st December, 1945.

(*a*) *Pulmonary Tuberculosis.*

Age-groups.	Sex	T.B. Minus.		T.B. plus 1.		T.B. plus 2.		T.B. plus 3.		Total.	
		Active	Quies.	Active	Quies.	Active	Quies.	Active	Quies.	Active	Quies.
0—5 years	M.	6	2	—	1	—	—	—	—	6	3
	F.	3	2	—	—	—	—	—	—	3	2
5—15 years	M.	16	38	2	3	3	—	1	—	22	41
	F.	8	27	4	3	3	2	—	—	15	32
15—25 years	M.	68	149	30	25	125	32	16	—	239	206
	F.	110	123	57	24	201	46	20	2	388	195
25—35 years	M.	58	137	52	54	246	129	19	11	375	331
	F.	66	158	56	66	303	121	26	12	451	357
35—45 years	M.	57	163	55	45	252	129	20	6	384	343
	F.	39	86	34	36	158	108	10	3	241	233
45—55 years	M.	53	88	26	22	204	97	16	8	299	215
	F.	28	45	15	12	62	51	12	4	117	112
55—65 years	M.	52	76	15	15	120	39	11	4	198	134
	F.	10	18	6	4	26	21	6	2	48	45
65 years and over	M.	24	32	5	6	37	8	5	4	71	50
	F.	15	20	4	—	20	6	2	—	41	26
All ages	M.	334	685	185	171	987	434	88	33	1,594	1,323
	F.	279	479	176	145	773	355	76	23	1,304	1,002
Grand Total		613	1,164	361	316	1,760	789	164	56	2,898	2,325
		1,777		677		2,549		220		5,223	

(*b*) *Non-pulmonary Tuberculosis.*

Age-groups.	Sex	Bones and joints (excluding spine).		Spine.		Abdomen.		Other organs.		Peripheral glands.		Skin.		Total.	
		Active	Quies.	Active	Quies.	Active	Quies.	Active	Quies.	Active	Quies.	Active	Quies.	Active	Quies.
0—5 years	M.	7	5	5	1	10	5	1	2	17	27	2	—	42	40
	F.	3	1	6	—	—	4	—	—	15	27	—	—	24	32
5—15 years	M.	39	42	14	25	13	43	3	3	99	303	3	5	171	421
	F.	34	37	16	16	6	20	2	2	76	309	2	2	136	386
15—25 years	M.	24	40	9	16	2	28	7	10	12	106	9	2	63	202
	F.	23	32	8	10	13	23	6	7	29	161	5	6	84	239
25—35 years	M.	17	24	14	19	3	5	8	16	11	23	12	10	65	97
	F.	9	13	16	7	12	17	6	18	24	91	13	9	80	155
35—45 years	M.	8	21	7	14	2	6	11	18	4	18	28	5	60	82
	F.	7	12	6	15	3	9	6	11	12	58	31	10	65	115
45—55 years	M.	11	17	6	5	4	2	4	5	2	8	11	1	38	38
	F.	8	5	6	4	2	2	6	4	4	35	24	10	50	60
55—65 years	M.	6	9	2	2	—	—	1	3	—	2	7	—	16	16
	F.	8	8	5	5	—	2	3	4	3	10	17	7	36	36
65 years and over	M.	8	5	3	2	—	—	1	4	2	—	6	1	20	12
	F.	3	5	2	6	—	—	2	—	4	8	12	5	23	24
All ages	M.	120	163	60	84	34	89	36	61	147	487	78	24	475	908
	F.	95	113	65	63	36	77	31	46	167	699	104	49	498	1,047
Grand Total		215	276	125	147	70	166	67	107	314	1,186	182	73	973	1,955
		491		272		236		174		1,500		255		2,928	